OPTIMIZED OPTIONS IN PLACE

New brands benefit the customers

1/16

SUSTAINABLE Chinese buses • FUSION ENERGY is the future • FISKARS GARDEN TOOLS has it all • WIELTON appreciates the advantages
Inspiration

The future begins

When the Composite China Expo 2015 Innovation Awards were presented last year, one of the winners was Changzhou Hongfa Zongheng Advanced Material Technology Co. Its lightweight-module, high-performance composite minibus uses Docol from SSAB to achieve its lightweight features.

CHANGZHOU’S BUS

is much lighter and offers better mechanical properties than conventional vehicles. This is due to its modular structure and the combination of high-strength steel and composite materials. The composite sandwich structures used for the bus body and panels not only ensure their strength and stiffness, but also dramatically reduce their weight. The automotive industry is one of the main pillars of the Chinese economy. In recent years, rapid market development has resulted in increased car ownership but also in these major problems: energy shortages, environmental pollution, and safety issues. Chinese auto manufacturers are therefore acutely aware of the need to reduce fuel consumption and pollution. “China is in the midst of rapid urbanization, with parking congestion and heavy traffic in major cities receiving increasing attention. Although the market for private cars remains, there’s a significant need for green public transport solutions. At the market leader in lightweight, sustainable steel, SSAB will cooperate with innovative companies to speed up this growth by supplying the materials needed to build these solutions,” says Jacky Li, SSAB’s Regional Sales Manager for Automotive in China.

Award-winning Chinese bus uses Docol to achieve lightweight properties.

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CEO’s notes

IT IS NOW ALMOST two years since SSAB and Finlands Rautaruukki merged to form the new SSAB. For us, this has been a great opportunity to examine ourselves and plan for the future. We have harmonized our product portfolio and chosen the best products and services to streamline our offering to you, our customer. We are continuously developing even more value-added services based on our 101-year-long experience serving our customers.

We are pleased to launch our Optimized for You program, with the new SSAB product groups to better meet your needs. Within these five families, we have selected customized products with SSAB quality and designed product offerings for specific purposes. We will continue to push beyond standard offerings, which we are proud to say is the SSAB way.

Now that we have one of the broadest product offerings on the market, we are combining the products with service. This is manifested by a new unit called SSAB Services. We will develop our offering to listening to your needs and making sure we provide solutions that make your business even stronger.

We’re not the biggest player in the steel industry, but being big is not what’s most important to us. Instead we want to be recognized for our quality and our belief in partnership. We want to develop a new steel industry standard for sustainability and performance, which is in line with what society expects from us in the global challenges that we are facing right now.

We want to develop things that set us apart from the rest of the industry—not by talking about our own processes, but by talking about how we can improve your business.

I would like you to experience the difference in SSAB.

Martin Lindqvist, CEO, SSAB.
Olavi Huhtala, Head of SSAB Europe.

In creating these new product families we have focused on customer needs in different segments and have designed product offers to meet these specific needs," says Huhtala. "We have selected our best products from our earlier ranges, while also developed new products, to create a complete and harmonised portfolio.

THE FIVE NEW PRODUCT FAMILIES under the SSAB brand cover a wide range of new and existing products and are part of SSAB’s new product portfolio, which is designed to offer greater clarity and understanding of what each product can offer. While previously products were named and defined by their manufacturing processes, the new product ranges are based on their function.

"Customers want to know what a product can offer, not where or how it is made, so it makes sense to group our products according to how they are used," says Olavi Huhtala, Head of SSAB Europe. "With the new naming structure we want to focus on what our customers get out of our products. This will make it much easier to identify the right product for the right application."

The new product groups are SSAB Domex, SSAB Form, SSAB Weathering, SSAB Boron and SSAB Laser Plus. In each instance, the SSAB name represents a guarantee that the customer is getting the same high quality steel, with properties above the standard norm, each and every time. All products are manufactured with clean raw materials from the best sources, along with special treatments to reduce harmful impurities. SSAB can also offer narrower tolerances than the industry standard and even the tightest customer-specific tolerances are available.

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THE FIVE NEW PRODUCT FAMILIES

SSAB Domex

A multi-purpose product group that covers applications within the heavy transports segment and bearing structures, such as chassis beams, frames, and lifting devices. It can also be used in bridges and buildings.

Hot rolled plate is a structural steel that is easy to weld, bend and process in workshops and onsite. Its high strength and good flangeability allow steel structures to be made using thinner steel plates and reduce number of welded joints.

Hot rolled strip consists of high strength, high-strength low-alloy (HSLA) steels that feature consistent quality and excellent engineering properties. It is the ideal choice when looking for high productivity, improved design possibilities and high-quality end products.

Cold rolled HSLA products are developed specifically for the demanding automotive industry, but can also be used in other segments. Metal coated products have unique forming properties combined to narrow tolerances. These products are developed for highly demanding applications that need the ultimate cold formability, combined with galvanic corrosion protection.

SSAB Form covers applications within the heavy transports segment and bearing structures.

SSAB Form is a range of products that offer extreme formability.

The multi-purpose family SSAB Domex is the biggest of the new product groups.
SSAB Boron ensures wear resistance.

SSAB Boron steel is a perfect base material for a great variety of products, parts and components, that need extreme hardness, wear resistance, high strength, toughness and resistance to mechanical load. Good forming, bending, welding and cutting properties enable the manufacturing of complex-structured components and parts, such as spades, knife blades, saw blades, disc harrows and cog wheels.

Hot-rolled plates have been developed to be hardenable, either by heat treatment after workshop processing or by a direct hot forming and quenching process, to get their final properties. This ensures longer lifetime and considerable weight reduction.

Hot-rolled grades have the same properties as hot-rolled plates and can further be delivered in normalized condition with improved ductility, so that it is easier to cut and form in customers’ processes. Cold-rolled is used for a variety of applications as a wear material and as a high strength structural steel. The steel can easily be hardened and can often be used without subsequent tempering. Tube uniquely combines ultra-high strength as quenched, formability as delivered, narrow tolerance and bare resistance with large variety of different shapes and sizes. Its outstanding properties will help reduce manufacturing costs and reach new limits in processes where formability, utmost strength and wear resistance are needed.

Workshop friendly SSAB Laser Plus steels are easily cut, weld and bend, offering high performance in automated production processes.

Hot-rolled plates are manufactured with clean raw materials from the best sources, and offer a guaranteed flatness tolerance of 3 mm/m after laser cutting. Shorter set-up and cutting times and reduced rework on finished components are definite benefits for workshops. Uniform steel quality ensures uninterrupted production and high-quality fabrication. It involves machined-finished components produced in large runs in a highly automated manufacturing process. The main benefits include consistent high quality and mechanical properties from batch to batch, and the parameterisation increase both production efficiency and profitability. Applications include forming, hole edging and hinges.

SSAB Weathering steel is used in Transtech trams in Helsinki, Finland.

SSAB Weathering is a range of corrosion-resistant steel grades that have been optimised through their alloying elements for a variety of environments and purposes. They are specially composed and designed to be exposed to atmospheric corrosion, and can offer significant economic benefits through low life time costs. They are ideal for flue gas ducts and chimney stacks, buildings, containers, engine heaters, and many other applications.

Hot-rolled plates and hot-rolled strip offers improved bending properties compared to standard weathering steels, and delivered with improved flatness guarantees to reduce customers’ need to reprocess the material before use.

Cold-rolled offers anti-corrosive properties that make it perfect for use in tough weather conditions with low maintenance costs during the lifetime. Tube is designed for advanced engineering and construction under tough atmospheric conditions, and its use minimizes the need for maintenance and corrosion-prevention treatments.

The SSAB Weathering range also includes the COR-TEN A and COR-TEN B weather-resistant steel grades, which are optimised through their alloying elements for a variety of environments. SSAB is the only supplier of COR-TEN in Europe.
A revolutionary design for a forest harvester that improves both performance and comfort — this is what won Finnish company Ponsse the Swedish Steel Prize 2015.

**THE PONSSSE SCORPION** is a totally new kind of forestry machine. It offers the operator total visibility and the ability to work comfortably and efficiently.

“We started the project at the request of customers that wanted to have a rotating operator cabin and we didn’t want to make compromises in the design,” says Technology and R&D Director Juha Inberg at Ponsse.

The machine features an ergonomic cabin that places the operator in the center of all the action. This gives operators full visibility in all directions, enabling them to work comfortably and efficiently.

A groundbreaking innovation with an eye-catching design made Ponsse winners of the Swedish Steel Prize 2015.

“It’s a great recognition for all our customers and employees and to all our suppliers as well,” says Juha.

It’s a big leap in improvement in the history of logging technology.

“We know we have a great product and the prize shows the customers just that,” says Carl-Henrik Hammar, Managing Director of Ponsse AB, the Swedish subsidiary of Ponsse.

The unique two-arm lift boom over the operator cabin is made of high-strength steel. The boom was developed by SSAB’s Strenx 700 MC Plus together with steel casts in an innovative way.

High loads, environmental stresses in tough terrain and winter conditions down to -40°C make fatigue a big issue in forestry. To get around this challenge, Ponsse uses Strenx 700 for the machine frame. The high-strength steel is made especially resistant to fatigue. The harvester head is made from the wear-resistant SSAB steel Hardox 500, which provides good abrasion resistance.

The high-strength steel makes the Scorpion more environmentally friendly as a result of its long maintenance intervals, low-emission engine technology and low surface pressure levels.

Going forward Ponsse has more innovations in store.

“You can never stop developing in this business,” admits Katja Paananen, Communications Manager at Ponsse.
A true modern day rail transportation system, the Futran System is not only easy to install but also environmentally friendly. It carries heavy loads using patented modular components designed from high-strength steel.

**THE TOP VIEW FROM COMPONENTS DESIGNED FROM HIGH-STRENGTH STEEL.**

A true modern day rail transportation system, the Futran System in Africa South of the Sahara, and South America.

**ABOUT MILOTEK**

Milotek is a South African-based company that owns the rights to the Futran system in Africa South of the Sahara, and South America.

**SSAB STEEL IN FUTRAN SYSTEM**

- **Strenx steel**
- **Hardox steel**
- **Strenx 700** instead of steel cables

**OUR FUTRAN SYSTEM** is a suspended transportation system for a cost-effective alternative to rail, trucks, conveyor belts and underground mine haulage systems, as well as buses and trams, "says Andries Louw, founder and CEO of Milotek, South Africa, the company founded to develop and commercialize the Futran System.

The system is a modular elevated track with self-propelled trains that carry heavy loads. It has components with a simplified design for easy installation and minimized maintenance costs. Each wagon can carry up to 20 tons and travels up to 56 miles per hour. These elevated tracks make it suitable in remote territory and in terrain inhabited by wildlife.

"It has a small footprint and is a very suitable solution for rugged terrain, which makes it optimal for use in places like Africa," says Louw.

The patented innovation was nominated for the Swedish Steel Prize 2015 and utilizes SSAB’s high-strength Strenx and wear-resistant Hardox in different components such as the track, the legs of the superstructure, the suspension system, the hanger brackets and the skids used for box haulage. Furthermore, by using the high-strength steel Strenx 700 instead of steel cables, the cost of the suspension system can be cut by 85 percent.

"To receive this recognition through the nomination is marvelous – it means we have done things right. The high-strength steel has been a big part of our success as the construction is new incredible lightweight and still robust," says Gerhard Claassen, chief design engineer.

The engineers at Milotek have no intention of stopping here – the innovation will continue.

"We have a lot of ideas on how to develop better and better products," Louw says. •

**HIGH EXPECTATIONS**

By dramatically increasing performance, the innovative Boom Booster Kit has made it possible to use the same crane for a wider variety of jobs.

**THE INNOVATION**

made global crane manufacture Terex Cranes, Germany, one of the nominees for the Swedish Steel Prize 2015 and winner of the People’s Choice Award. It’s a great honor to be nominated as one of the top four – it absolutely a win in itself. To become People’s Choice Award winner shows that we have a popula product," says Harald Riedinger, Director Technology Innovation at Terex.

"This attracts new customers from all over the world. Clients have already shown a lot of interest," says Harald Riedinger. New solutions are on their way and are being developed for other crane models. •

**YOUR AVERAGE** sugar cane harvest lasts 240 days. Imagine that instead of having to stop the milling machines and change knives 120 times per harvest, you only have to do it twice. That is what you’ll achieve with Fácil System’s new sugar cane shredding mill.

For their new system for sugar cane shredders they use knives developed with wear-resistant Hardox 600 steel.

"By using wear-resistant materials, there is also a reduction in electricity consumed by the shredder," says Laércio Ribeiro, CEO of Fácil System, Brazil.

The machine’s outlet grate, which determines the straw particle size, is made from Hardox 450 and improves particle size performance. The extraordinary solution as a whole was nominated for the Swedish Steel Prize 2015.

I have spent 17 years developing this system and the nomination is proof that it was the right thing to do. It also sends a message to our customers about the success of the solution," says Ribeiro.

Cane straw as a raw material has started to be used as boiler fuel to produce electricity. The market is growing fast.

**ABOUT FACIL**

Since 1986, Fácil System develops and customizes machine design as well as complete industrial plants.

**SSAB STEEL IN FACIL’S SUGAR CANE SHERDERS**

- **Hardox 600 for the knives.**
- **Hardox 450 for the machine’s outlet grate**

and the design of the mill was created out of a need to serve this segment. The mill’s rotor, which shreds the sugar cane straw, consists of a set of shredding knives bolted directly to the equipment support at the axles.

"We are unrivaled in the grate material and in the knives," Ribeiro says. Using straw as a source of energy is already a reality in Brazil. The material, left over after producing ordinary ethanol from sugar cane, is considered a "green" and renewable energy source that is widely used to produce fuel for cars, has also become a raw material with great potential for a new biofuel, called second-generation ethanol or E2G. •

**STICK TO THE STRAW**

60 times extended service life. Yes, you read it right: 60 times. That’s an innovation you rightly can claim true progress and that’s what Fácil System has achieved with its new sugar cane shredding mill.”

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Focus: Offshore

Huisman designs and manufactures heavy construction equipment for onshore and offshore companies. Huisman’s cranes – ranging from heavy-lifting to deep-water operating cranes – contain high strength steel, mainly Hardox 400 and Weldox 700, but Strenx 700 and Strenx 960 are also used.

“We are always battling between strength and stiffness difficulties, as our products are highly loaded and have big dimensions,” says Clive Anstey.

“The weight of our cranes and the harsh conditions they operate in is challenging for our engineers. But, using high strength steel is one of the pieces to complete this puzzle.”

Huisman relies on the quality of SSAB’s steel as well as its technical expertise.

“We can count on SSAB’s quality, delivery reliability and competitiveness, especially in our global market where compliance with the certifying authorities is very important.”

Unchartered territory:
EXPLORING THE OFFSHORE MARKET

Now that oil and energy prices are down, companies in the offshore industry are looking into how they can improve efficiency in their designs and processes. Some are slowly starting to explore the benefits of using high strength steel.

by ALANNAH EAMES
THE OPPORTUNITIES for the use of high strength steel in offshore applications are endless. Besides oil and gas platforms, it is ideal for equipment positioned high up – and, therefore, which needs to be lighter – on rigs or at offshore towers and production equipment such as winches, compressors or pumps. Structural steels are dominating but there are also a number of Herold opportunities for two plates, disk reinforcements and cargo holds.

And, then there’s also the renewable or ‘green’ energy market where high strength steel could be used in offshore wind, wave and tidal turbines. “Now is a golden time to look into these opportunities for efficiency,” says Joakim Nyström, SSAB’s Key Segment Manager for Energy & Offshore. “High strength steel may not work in every application but in the offshore team – including both SSAB Europe, SSAB Special Steels and SSAB Americas – we have a fantastic offer. We have a full range of classes grades from Grade A to Strex 700-OME with ABS EQ 70 approval in combination with great prefabrication possibilities.”

One particularly successful offshore product has been building legs for jack-up rigs, where SSAB high-strength steel is used for chords on each jack-up leg assembly. “The high strength steel is also used in lift boat applications,” says Chris Gasper, General Manager at SSAB in USA. “These legs – up to 150 meters long – require strength in order to stabilize the boat for performing maintenance and lifting operations for the rig at sea.”

The US operations have been able to offer customers a ‘One-Stop-Shop’ together with manufacturing company JSA Group. Offshore jack-up drilling rigs and jack-up lift-boats are very complex structures incorporating a wide variety of materials, machinery and equipment.

“The fundamental task of these units is the ability to raise and lower the hull clear of the water, by means of a rach and piston driven system supporting and elevating the heavy platform numerous times over the life of the rig,” says JSA President Jay Fogal.

PRODUCTION of the jack-up leg components involves heavy fabrication of high strength steel, flame cut and/or machined parts and the steel forming of pipes, transitions and other heavy components.

“In 2012, our Houston-based JSA were searching for a domestic source for high-quality quenched and tempered steel for offshore jack-up rig legs. We met with a team from SSAB in Houston and later visited their steel mills in both Mobile, Alabama, and Borlänge, Sweden, says Fogal.

“We were highly impressed that the Mobile mill had adopted many of the quality aspects that SSAB was known for at its Swedish operation. Since that time, our group has purchased several thousand tons in the thickness range of 1” to 2” which were produced in both their US and Swedish mills. We were also thoroughly impressed with the flattens, surface condition and weldability of the steel. In particular, the extraordinary consistency in chemical and mechanical properties of all the plates made for a consistent end product, explains Fogal.”

These factors coupled with constant timely deliveries of quality products and materials have formed the foundation for a lasting and mutually satisfactory relationship between SSAB and JSA.

UNTIL NOW, the use of high strength steels in offshore products has been low. According to Nyström it’s because the industry has not prioritized on making its products lighter, plus the fact that regulations governing the materials used in offshore designs are very tight.

“But times are changing,” he explains. “The market is more interested in weight reduction opportunities now compared to ten years ago. The extreme low oil price force the market to find every possibility for increasing efficiency and reducing cost, and using high strength steels is one.”

There are two major challenges though. First is the related to the harsh conditions of operating offshore. The advanced load case made by waves and wind cause torsion, twist, horizontal and vertical stresses that together with salt and humidity affect the steel structures.

The second is classification rules that state limitations for steel strength on ship, platform hulls and fixed platforms to maximum 500 MPa, the SSAB TMG rolled high strength steels are here an opportunity. For secondary structures, machinery and equipment there is more freedom of material choice. Here we see great possibilities for our customers to use classed Strex 700 0ME and also normal Strex 700. Even Strex 960 can be used in unwelded structures with special approvals.

“We want to promote cold-forming and HFMI*-treatment to remove the welds from the most critical areas and ensure they are as fatigue resistant as possible. In the past cold-forming was not allowed; now it can be used in the design as long as some extra tests are conducted to prove it is suitable for the application,” says Nyström.

High Frequency Mechanical Impact

SSAB is a preferred supplier for us due to its competitive pricing, product quality, wide product portfolio and solid stock program.

GAUTE FARDAL, LEAD GROUP CATEGORY MANAGER AT AKER SOLUTIONS AS IN EGGEBY/HUDSO, NORWAY.

Aker Solutions is a global provider of products, systems and services to the oil and gas industry. The portfolio of products and services includes subsea equipment and production systems, field development engineering, and maintenance and modifications services. ’Aker Solutions’ products are often installed and operated in harsh environment. This requires durable and reliable solutions, of high quality, including the material itself. SSAB/Tibnor has produced and provided a range of such products to Aker Solutions for many years.

Bulk steel deliveries, plates, bars, profiles and tubes that also relate to cold worked products; for both topside and subsea projects. SSAB/Tibnor have been a preferred supplier to Aker Solutions in several projects due to its competitive pricing, wide range of products and material qualities and a solid stock program.”

Aker Solutions
Fighting fatigue

Weld quality is crucial to the performance of any steel application. This is especially true for parts made of High-Strength Steel (HSS) due to the increased stress levels to which they are exposed. Now PhD student Thomas Stenberg, a researcher from Stockholm, has created a new method for assuring weld quality.

*by ISABELL KUGER*
When failures and fractures occur in HSS products, they usually appear around the welds. When parts move or vibrate, they are more susceptible to fatigue – or wear and tear – because of the increased stress concentrations between the weld and the base material. If the quality of the weld is substandard, cracks will eventually begin to appear.

As Anders Ohlsson, Manager of Joining & Thermal Cutting Technologies at SSAB’s Knowledge Service Center explains, it is very costly to carry out reliable quality assurance on welded structures. As a result, one of the main limitations in the steel industry today is its inability to effectively ensure weld quality in its products.

“Welding typically takes place during manufacturing, but can only be quality controlled through visual inspections once the process is complete. A component may therefore go through the entire manufacturing process before a weld defect is discovered, after which it would need to be either repaired or scrapped,” he says.

“Meanwhile, due to time and cost constraints, it’s normally only possible to inspect a fraction of the total output. So, even though a lot of time is invested in carrying out weld inspections, you still run the risk of delivering parts with welding defects to the market,” adds Ohlsson.

Thanks to a new innovation by Thomas Stenberg, a PhD student at KTH Royal Institute Of Technology in Stockholm, these concerns will soon be history. Stenberg and his colleagues have developed a new robust quality assurance (QA) method, which uses a laser profile scanner to assess the welded surface and measure the quality of the weld. The most revolutionary aspect of this method is that the assessment takes place in real time – online – during the actual welding process.

“This system will provide instant feedback to the welding operator on whether the welded joint fulfills all its requirements,” explains Stenberg.

“Thomas Stenberg and colleagues are currently working on developing a commercial version of the method, which is expected to be available on the market within one to three years.”
to adjust the process parameters to ensure that the weld quality complies with the desired result, without needing to disrupt the process or repeat the work.”

Ohlsson adds that the new QA method has the potential to revolutionize the ways in which many of SSAB’s customers utilize HSS, opening up opportunities for more applications to benefit from its superior qualities which include lower component weight and reduced fuel consumption.

“Minimizing the occurrence of failures caused by fatigue will enable us to use HSS in many applications in which they cannot be used today — such as in machines and components that are known to be subject to high stress concentrations. Examples of these applications may include chassis for manufacturing and forestry equipment, trailer chassis and components used in energy production,” says Ohlsson.

According to Stenberg, who won the 2015 Swedish Steel Prize “University Challenge” award from SSAB for his groundbreaking work on the new QA method, the method will deliver significant benefits to the customers who implement it.

“Firstly, we expect productivity to increase by about 50 percent due to increased robot travel speed, coupled with a reduction of up to 30 percent in the consumption of weld filler materials,” he says. “It will also allow manufacturers to cut lead times, thanks to the reduced number of inspections, while the need to scrap or rework products will be minimized.”

Today the inspection of the welded joint can only be done after the job is completed.

Here are four examples of welding defects that may occur during steel welding.

**1. LACK OF PENETRATION/ROOT DEFECT**

**Cause**
- Too small joint angle
- Too small gap
- Too large root face
- Wrong welding technique
- Too low heat input

**Remedial actions**
- Increase the joint angle (45 – 60°)
- Increase the gap
- Adapt the root face in relation to the heat input (1 – 2 mm)
- Decrease the inclination of the electrode
- Increase the heat input

**2. LACK OF FUSION**

**Cause**
- Travel speed too low (weld metal starts to flow in front of the arc)
- Travel speed too high
- Arc voltage too low
- Too long “stick out” distance
- Contact tip worn out
- Insufficient inter-run cleaning
- Welding in inclining position (downhill)

**Remedial actions**
- Increase the travel speed
- Decrease the travel speed
- Increase the arc voltage
- Decrease the stick out distance
- Replace the contact tip
- Remove the surface slag prior to next run
- Adjust the travel speed in relation to the position

**3. INCOMPLETELY FILLED GROOVE**

**Cause**
- Too high travel speed
- Number of beads too few
- Misplaced weld bead

**Remedial actions**
- Reduce the travel speed
- Use sufficient number of beads
- Make sure that the weld bead covers the groove

**4. HOT CRACK/SOLIDIFICATION RACK**

**Cause**
- Weld bead too deep in relation to the width
- High C, S, P, Nb pick-up
- Too high travel speed
- Large root gap

**Remedial actions**
- Make sure that the width/depth ratio of the weld exceeds about 1.0
- The joint must be free from impurities
- Reduce the welding speed
- Reduce the root gap

"...the welding robot will be able to adjust the process parameters to ensure that the weld quality complies with the desired result, without needing to disrupt the process or repeat the work."
IS THIS THE ANSWER?

Imagine an energy source that is cheap, clean and abundant. That’s exactly what scientists believe fusion energy can achieve.

The quest to produce fusion energy started in the 1940s but it has stepped up a pace recently as a new wave of startups — financed by risk-loving entrepreneurs and governmental agencies — dig deeper into the mysterious world of fusion power.

By ALANNAH EAMES Photo: VINCENT FOURNIER

SO, WHAT IS FUSION ENERGY?

Not to be confused with nuclear energy, it is basically energy that is formed when small atoms are squashed together to form bigger ones. This releases a huge burst of power that creates a lot of energy. The best example of fusion energy is the sun, which is a giant fusion reactor constantly squashing hydrogen nuclei into heavier elements to create sunlight.

Fusion could solve a lot of our current energy problems. It would produce much more energy than other sources like nuclear. And it’s a clean energy source with no risk of radioactive disasters — fusion reactors just stop working when they run into trouble. Another plus is that fusion runs on common elements like hydrogen, the most abundant element on Earth.

But scientists have been battling two major challenges for decades. The first is that atomic nuclei — positively charged protons and neutrons — don’t want to fuse. To force them together, they have to be heated to extreme temperatures so they become a plasma. The plasma must be hot enough and the nuclei bashed hard enough together so that they fuse. The second challenge is how to confine this plasma, which is neither liquid, sold, nor gas. Another issue is to find materials such as steel — for the wall linings of fusion reactors that can withstand high temperature, high thermo-mechanical stresses and embrittlement.

An international consortium is currently building the International Thermonuclear Experimental Reactor (ITER) near Marsailles in France. It marks a milestone in fusion energy research but it’s already behind schedule — it won’t open before 2027 — and is over budget by USD 15 billion so far.

There’s no doubt that fusion energy will be possible in the future. The only question is when. •
Fiskars is Finland’s oldest company – and some of its bestselling products may be hundreds of years old – but it never stops improving its products.

“At Fiskars we believe that even the simplest things can be made better and smarter,” says Markku Pietiläinen, Sourcing Manager, who purchases the company’s raw materials and components.

“For example, take our ‘old’ Fiskars spade from the 1960s – it might look the same as the new one that you could buy today, but the old one is around 30% heavier. New materials mean we can make our products lighter and stronger, and this is better for the user.”

Fiskars’ relationship with SSAB is a long one dating back to the 1960s. As Fiskars’ sales and manufacturing have become more global, Pietiläinen says SSAB is the perfect example of a top-quality supplier that can offer a global service for all of Fiskars’ factories.

Fiskars’ Wood Xpert Felling Lever, a product launched in 2015 and acknowledged as one of the strongest products of its kind in the world, is just one example of the strong collaboration between the two companies. The lever is used to bring a tree down safely but also to section logs for transportation. Improvements on its predecessor include a detachable log hook, a revised comfortable SoftGrip handle and a lightweight tubular steel construction to make it easier – and lighter – for the user to handle.

“This product was only possible thanks to the joint collaboration with SSAB,” says Pietiläinen.

“We needed a 1,400 grade, a new kind of steel from SSAB with a special shape. Our R&D guys in Finland worked very closely with SSAB to create these steel tubes with a unique design and material.”

Like many other Nordic companies, Fiskars has a reputation for producing functional, long-lasting products. That’s why they need top quality and take no risks with their suppliers.

“SSAB has very strong steel and has been a key partner for us in ensuring that we can meet our customers’ needs.”

MARKKU PIETILÄINEN, SOURCING MANAGER

Fiskars may be Finland’s oldest company and produces products for the home, garden and outdoors. Its products are renowned worldwide for their functionality and cutting-edge design. Its most famous brands are Fiskars, Iittala, Royal Copenhagen, and Gerber.

Fiskars employs 8,600 people in 30 countries and had net sales of EUR 768 million in 2014. It is listed on the Nasdaq Helsinki Stock Exchange. More information at www.fiskarsgroup.com

CUTTING EDGE

Fiskars’ new Wood Xpert Felling Lever is said to be one of the strongest tree felling levers in the world. **This breakthrough was possible thanks to the use of customized lightweight steel tubes from SSAB.**

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Fiskars manufactures functional, long-lasting products made of strong, high-quality steel.

**CONSTRUCTION**

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**ABOUT FISKARS**

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**ALANNAH EAMES**

**FISKARS**

**photo:** FISKARS
The lightweight design of the new felling lever makes it easy to use. It also includes a detachable log hook.

that we create lasting and functional products. The quality is very consistent with almost zero quality claims,” says Pietiläinen.

SSAB’s global network has also been a major plus for Fiskars, according to Pietiläinen. “Our factory in Slupsk, Poland, which produces garden tools, always tells me that SSAB is their favorite supplier as they are so reliable. They can’t find enough good things to say about SSAB.”

Fiskars wants to replicate this way of working at its other factories, such as its site in Oslo, Norway. “SSAB’s CEO and top managers visited our factory in Oslo. That was really nice. It makes us feel like they make time for us even if they have thousands of other customers,” says Pietiläinen.

Although Fiskars’ products already are tougher and weigh less, there’s still room for continuous improvement. “SSAB is developing lighter and stronger materials, exactly what we want for our products. We’re moving in this direction and this is something we can do together with SSAB,” he concludes.

Fiskars’ new tree felling lever was launched in 2015. It is used for felling medium-sized trees and can also be used as a support for sawing and carrying logs. The blade drop is made from forged hardened steel and the shaft is made from lightweight special steel. All the boron steel used in the product comes from SSAB, which customized the material in collaboration with Fiskars’ product development team. The Wood-Xpert Felling Lever won a Red Dot product design award in 2015. Fiskars also buys Docol 500, steel tubes and boron steel sheets from SSAB for other products.

My Inner Strenx member Wielton’s commitment to product development makes it a long-haul candidate for capturing new trailer markets. by ANN TÖRNKVIST photo: ADAM LACH

WIELTON AS
Founded: 1995
Markets: 35 countries in Europe, North Africa and the Middle East.
Number of products: More than 65
SSAB metals used in production: Strenx 700 and Hardox 450
Current focus of product development: Wielton is testing hybrid welding technology that lessens laser and GMA methodology. All test results are analysed by Wielton and SSAB specialists.

“IT’S A SIGNIFICANT CONTRIBUTION”
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