

**STRENX™**  
PERFORMANCE STEEL



# THE BEAUTY



/ **SSAB**

THE BEAUTY OF STRENX:

# STRONGER AND LIGHTER

I CAN SAVE FUEL



I CAN LIFT HIGHER



In the never-ending battle for improved performance of steel products, less weight wins.

To make products lighter you need stronger steel that can be used in thinner dimensions. Strenx high strength structural steel is our solution to this challenge.

With Strenx steel, trailer manufacturers can specify more payload. Truck owners can cut down on fuel consumption and CO<sub>2</sub> emissions. Crane operators can improve their business by reaching higher and further. Farmers can cover more acres in a day.

That's the beauty of Strenx steel: Whatever your application, Strenx offers new options for improving its performance.

I CAN LOAD MORE



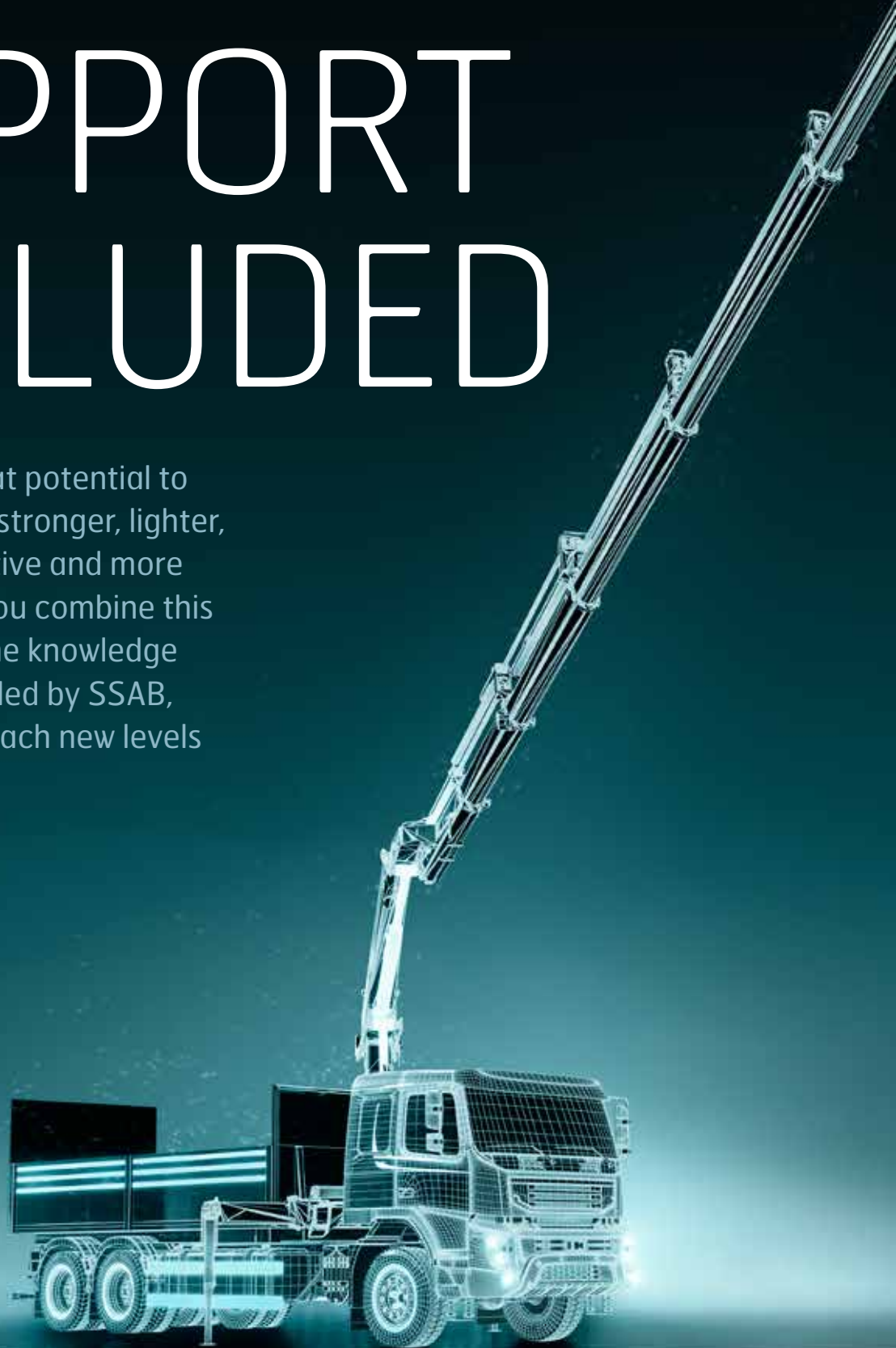
I CAN BE SAFE



THE BEAUTY OF STRENX:

# STEEL WITH SUPPORT INCLUDED

Strenx steel has great potential to make your products stronger, lighter, safer, more competitive and more sustainable. When you combine this superior steel with the knowledge and resources provided by SSAB, your products can reach new levels of performance.





SSAB has a long history of supporting its customers in product development, from innovation and the design of new applications to the choice of material, life cycle cost calculations, logistics solutions, and workshop recommendations.

In short, as a Strenx steel customer you have access to three areas of service and support:

#### **SSAB Tech Support**

The first line of technical support is staffed with experienced engineers on call around the clock, providing assistance in your own language or in English. Technical support handles all your practical, day-to-day questions about the choice of materials, welding parameters, production practices and much more. Tech Support can be reached by phone or via the SSAB help desk. You can learn more about technical support at [ssab.com](http://ssab.com).

#### **SSAB Shape**

Provides engineering, preprocessing and logistics services to complement your own resources in a way that improves total production efficiency and economy. You have access to a network of service centers equipped with advanced machinery for the preprocessing of Strenx steel. You can even have semi-finished parts and ready-to-assemble kits delivered direct to your production lines.

#### **SSAB Knowledge Service Center**

A unique resource for application and production development. Our material and production specialists focus on making your products easier to manufacture, able to carry more payload, last longer and require less maintenance. The SSAB Knowledge Service Center has expert teams supporting our customers in different areas:

#### **Structural technology team**

Focuses on advanced design solutions and structural integrity relating to the use of high strength steel in strong and light constructions.

#### **Forming technology team**

The main objective of the forming technology team is to give customers support on the best practices for cutting and forming high strength steel.

#### **Joining and thermal cutting team**

Provides our customers with technical support and information on welding and thermal cutting of SSAB steel grades.

#### **Production efficiency team**

Performs production flow analysis and process optimization in order to find savings in production costs.



“

Think  
thinner  
and get  
stronger

”



THE BEAUTY OF STRENX:

# DESIGN CHALLENGES AND REWARDS

**Strenx steel makes the sport of chasing percentages much more interesting. Not only to watch, but also to take part in.**

In the hands of skilled and ambitious design engineers, Strenx steel can produce outstanding results. Depending on the starting point, designers can cut 20, 30, 40 percent and more weight off steel structures – and yet still achieve greater performance and a longer service life.

By thinking thinner you can achieve stronger and lighter solutions for a wide range of applications. Lifting and transportation are the primary areas where steel with a yield strength from 600 MPa and upwards is a game changer.

If a current design works fine with a lower strength steel, switching to Strenx steel can make it even better. However, by taking a more radical approach and starting over, the potential becomes even greater.

In reality, it is seldom that we start with a blank screen. Previous products, production facilities and other practicalities have a way of holding us back. However, a healthy dose of free thinking can reveal new ideas for stronger, lighter, and more competitive products. Strenx products, if you like.

Working with steel in the 600-1300 MPa range will certainly challenge some preconceptions of steel design. In some cases it is almost like handling a brand new material.

To support your new ideas, you are welcome to explore our design and innovation resources at the SSAB Knowledge Service Center. New design solutions can be tested virtually with the help of computer simulations for stress distribution, fatigue conditions, and other design criteria.

Now, let the race for percentages begin...



THE BEAUTY OF STRENX:

FROM  
600  
TO  
1300\*  
MPa

If you have ever thought that all steel is basically the same, Strenx structural steel will make you think differently. Strenx steel is strong and reliable from the surface to the core.

The first thing you will notice is the surface quality of Strenx steel. Thickness and flatness tolerances are equally impressive, and verified by the Strenx guarantees.

The properties within the steel – such as yield and tensile strength, bending performance and impact toughness – are also carefully tested to ensure reliability and consistency in every delivery.

\*At the time of writing, open for extension.



## THE PERFORMANCE PORTFOLIO FOR STRENX STEEL PLATE, STRIP, TUBE AND SECTIONS

Strenx hot rolled plate products							
Name	Thickness range [mm]	Yield strength $R_{p0.2}$ , min [MPa]	Tensile strength $R_{m,min}$ [MPa]	Elongation $A_5$ , min %	Bendability Minimum punch radius R/t, transverse to rolling direction, $8 \leq t < 15$ mm	CET/CEV <sub>Typical</sub> Plate at t = 10 mm	Impact toughness [J] at -40°C
Strenx 700	4-53	700	780-930	14	1.5	0.29/0.43	69
	(53)-100	650	780-930	14			
	(100)-160	650	710-900	14			
Strenx 900	4-53	900	940-1100	12	2.5	0.36/0.55	27
	(53)-100	830	880-1100	12			
Strenx 960	4-53	960	980-1150	12	2.5	0.36/0.55	40
	(53)-100	850	900-1100	10			
Strenx 1100	4-(5)	1100	1250-1550	8	3.0	0.36/0.55	27
	5-40	1100	1250-1550	10			
Strenx 1300	4-10	1300	1400-1700	8	4.0	0.42/0.65	27

Strenx hot rolled strip products							
Name	Thickness range [mm]	Yield strength $R_{p0.2}$ , min [MPa]	Tensile strength $R_{m,min}$ [MPa]	Elongation $A_5$ , min %	Bending radius [R/t] $3 < t \leq 6$ mm	CET/CEV <sub>Typical</sub>	Impact toughness [J] at -40°C
Strenx 600 MC	2-10	600	650-820	16	1.1	0.21/0.33	27
Strenx 650 MC	2-10	650	700-880	14	1.2	0.22/0.34	27
Strenx 700 MC	2-10	700	750-950	12	1.2	0.25/0.39	27
Strenx 700 MC Plus	3-12	700	750-950	13	1.0	0.24/0.38	40 (-60°C)
Strenx 900 MC	3-10	900	950/1200	8	3.0	0.25/0.50	27
Strenx 960 MC	3-10	960	1000-1250	7	3.5	0.28/0.51	27
Strenx 1100 MC	3-8	1100	1250-1500	6	4.0	0.30/0.50	27 (-20°C)

Strenx cold rolled products							
Name	Thickness range [mm]	Yield strength $R_{p0.2}$ , min [MPa]	Tensile strength $R_{m,min}$ [MPa]	Elongation $A_{80}$ , min %	Bending radius [R/t]	CET/CEV <sub>Typical</sub>	Impact toughness [J] at -20°C
Strenx 700 CR	0.7/2.1	700	1000-1200	7	2.0	0.29/0.40	
Strenx 960 CR	0.7/2.1	960	1200-1400	3	3.5	0.28/0.39	
Strenx 1100 CR	0.7/2.1	1100	1300-1500	3	3.5	0.30/0.41	

Strenx tubes and sections							
Name	Wall thickness [mm]	External dimensions [mm]	Yield strength $R_{p0.2}$ , min [MPa]	Tensile strength $R_{m,min}$ [MPa]	Elongation $A_5$ , min %	CET/CEV <sub>Typical</sub>	Impact toughness [J] at -20°C
Strenx Tube 700	3-10	33.7 - 323.9 30 x 30 - 300 x 300 50 x 30 - 400 x 200	700	750-950	10	0.24/0.38	40
Strenx Tube 900	4-6	76.1 - 219.1 70 x 70 - 160 x 160 80 x 60 - 200 x 120	900	930-1200	7	0.25/0.50	40
Strenx Tube 960	4-6	76.1 - 219.1 70 x 70 - 160 x 160 80 x 60 - 200 x 120	960	980-1250	6	0.28/0.51	40
Strenx Section 650	2.5-10		650	700-880	12	0.22/0.34	40
Strenx Section 700	3-10		700	750-950	12	0.24/0.38	40
Strenx Section 900	3-6		900	930-1200	8	0.28/0.51	40

Strenx properties are covered by Strenx guarantees. For information about individual grades, please refer to the documentation available at [ssab.com](http://ssab.com) or from your SSAB sales contact. SSAB reserves the right to change specifications without prior notice. The tables are for reference only. The product data sheet assigned to a specific product holds all valid and guaranteed properties.

# POTENTIAL APPLICATIONS

Container trailers  
Flatbed trailers  
Box trailers  
Timber trailers  
Tipper trailers  
Bulk and tank trailers  
Car carriage trailers  
Train cargo wagons  
Passenger trains  
Light rail trains  
Buses and light trucks  
Telescopic and articulated boom lifts  
Scissor lifts  
Truck-mounted loader cranes  
Telehandlers  
Concrete pump cranes  
Mobile cranes  
Cargo handlers  
Forestry harvesters  
Forestry forwarders  
Agricultural tippers and trailers  
Front loaders and attachments  
Sprayer chassis and booms  
Jack-up legs  
Pylons  
Marine and offshore cranes  
Safety boat davits  
Winches and deck equipment  
Ramps, decks and cargo hatches  
Gears and racks



THE BEAUTY OF STRENX:

# A WIDE VARIETY OF APPLICATIONS

Whatever your application, Strenx steel offers new options for improving its performance. Here we present some products that benefit from using high strength steel to reduce the weight of the structure.

## Reach higher and further

Strenx high strength structural steel can make lifting equipment more competitive through increased reach both upwards and outwards. Smart design utilizes the high yield strength of Strenx steel to achieve greater performance without compromising on the high levels of personal safety required by lifting equipment. This can be done without making the complete unit too heavy for the roads on which it travels.

## Load more and burn less fuel

The transport industry is constantly looking for ways to increase payload and improve fuel efficiency for every loaded ton, unit or passenger. Trucks, trailers, trains and buses need to become lighter without compromising on performance, safety and service life. Strenx steel is the answer, delivering yield strengths of 600-1300 MPa, while still being as welcome in the workshop as regular steel.

## Good news for farming and forestry

High capacity and low weight are common needs for agriculture and forestry applications. A higher load capacity has a direct impact on the financial result. Low equipment weight minimizes soil compacting on crop fields as well as ground damage in the forest. A strong and light harvester – whether it collects crops or timber – means less fuel, less wear and less hours worked to get the same result. Good news for the owner and good news for the driver.

## Safe and strong for marine and offshore structures

Strenx steel is the safe choice for strong and light structures operating in sensitive marine and offshore environments. Thanks to its unique combination of strength, toughness, consistency, and weldability it exceeds the demanding classification standards. The extreme cleanness of Strenx steel creates high toughness at low temperatures, a guarantee of the highest possible safety in critical applications.

THE BEAUTY OF STRENX:

# WELCOME TO THE WORKSHOP

Pushing the limits of the steel and design solutions requires high consistency and precision of the steel to secure the performance and safety of the product.

Through constant process improvements we are able to deliver Strenx steel with a unique set of guarantees for thickness, flatness and bending properties. Strenx guarantees are your safeguard for trouble-free production, day after day, year after year. And the material can be processed by the same kind of machinery and technology used for conventional steel.

SSAB is the world's most experienced producer of high-end quenched and tempered steels. Strenx steel's extreme cleanliness, lean alloy solution and high-quality manufacturing processes have great impact on toughness, fatigue strength and performance in sub-zero conditions.

Since Strenx is stronger, it can be used in thinner dimensions to make lighter structures. It improves the final product, and it brings benefits along the way. Thinner material usually means less welding and faster production. Everyday handling in the workshop becomes lighter, and there is less steel to take up storage space.

When new design and innovative solutions require new and smarter production methods, you can always turn to SSAB Tech Support for guidance and recommendations. We are happy to provide you with expert advice on materials and processing when you are developing new and improved applications.

## Strenx guarantees

Strenx guarantees cover thickness tolerances, flatness tolerances and bending properties.

### Thickness guarantee

The thickness tolerances are more narrow than those specified in the relevant EN standards for each product group.

### Flatness guarantee

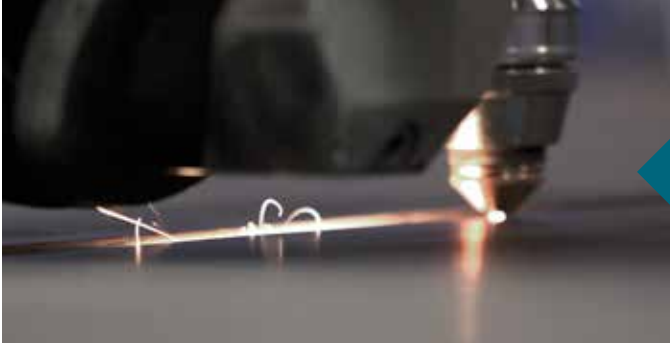
Strenx has five classes of flatness tolerances, depending on the type of product and material strength. All classes conform to or are more stringent than specified in EN 10 029. Class A and B also conform to or are stricter than specified in EN 10 051.

### Bending guarantee

The bending guarantee depends on the yield strength of the steel grade, and always conforms to or is more stringent than the requirements in the relevant EN standard for each product.

## Welding

Strenx can be welded using any conventional welding method. MAG welding is the most common technique today, since it is very easy to automate for high productivity. Other suitable methods are MMA welding, TIG welding, plasma welding, submerged arc welding and laser welding.



## Thermal cutting

The fine surface finish of Strenx plate and strip makes it perfect for laser cutting without any additional surface preparation. Thermal cutting of hot-rolled Strenx steel sheet and plate is performed with oxy-fuel flame, plasma and laser.

## Bending

Free bending and roll bending of Strenx steel plate and strip can be done using standard bending machinery. Uniform properties, close thickness tolerances and high surface quality ensure a predictable bending process.



## Mechanical cutting

Mechanical cutting of Strenx is best performed with guillotine shears. Consider carefully the settings of the cutting machine. The most important factors are clearance, cutting angle and blade hardness. The plate should be allowed to warm up thoroughly to around +20°C before it is cut.

## Machining

Strenx can usually be machined without special equipment. Stable machinery fitted with high-speed steel and carbide tools is recommended when drilling, countersinking, tapping, turning, and milling.



More detailed workshop instructions for Strenx steel can be found at [strenx.com](http://strenx.com).

THE BEAUTY OF STRENX:

# SOLUTIONS TAILORED TO YOUR NEEDS





Designers, engineers, and manufacturers can obtain customized solutions for the lifting, transportation, agricultural, and other segments that benefit from using Strenx.

Through our SSAB Shape centers we offer a wide range of services for the development and prefabrication of high strength steel parts. Strenx steel users across the world can gain a competitive edge through joint development projects. You have access to steel engineering experts, prototype manufacturing and supply of preprocessed parts delivered just-in-time to your production.

#### Processing services

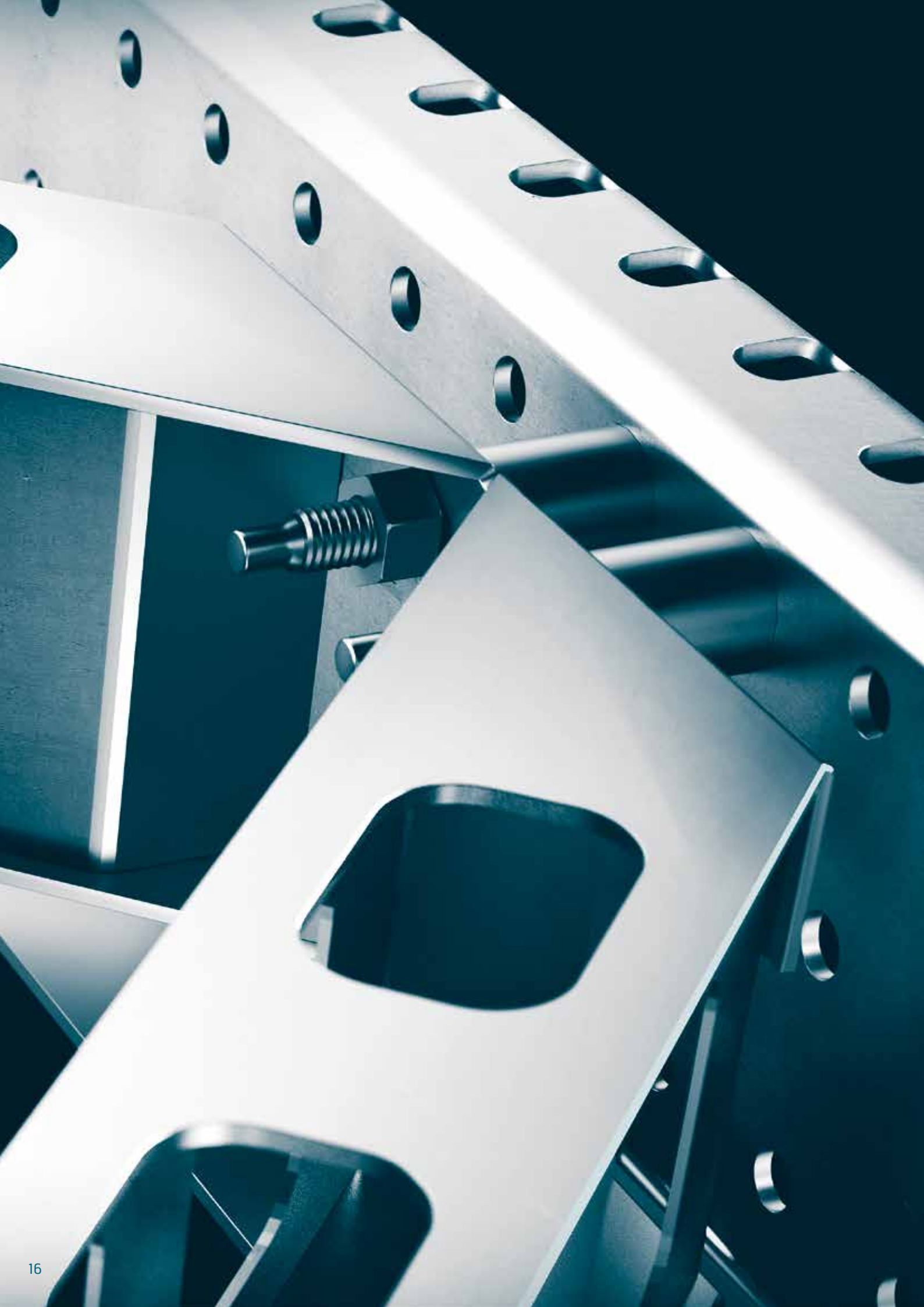
Strenx steel plate, strip and tubes can be processed in lengths in excess of 20 meters and with bending forces of more than 4,000 tons.

Using the high-end equipment at SSAB Shape centers makes perfect business sense. You gain access to production capacity without investing in new machinery for in-house production and you are able to cut lead times.

The machinery and technology provided meet practically every type of steel processing need:

- Laser cutting
- Laser welding
- Oxy-fuel flame cutting
- Bending
- Plasma cutting
- Shear blanking
- Sawing
- Roll forming
- Roll bending
- Machining
- Slitting







THE BEAUTY OF STRENX:

# JUST-IN-TIME AND JUST RIGHT

Strenx steel is delivered via an established and reliable supply chain, assisted by advanced logistics systems that ensure you receive the material at the right place, in the right time and in the right condition.

The most common grades and dimensions of Strenx can be delivered to you within 48 hours, directly from the mill or from local stock.

SSAB logistics can be adapted to suit your production, depending on production volumes and location. Delivery solutions include supply and inventory management, JIT and VMI (Vendor Managed Inventory).

Strenx steel is produced according to strict quality specifications. Each plate, sheet, coil and tube is marked and can be traced back to production for quality assurance.

## Testing and documentation

Extensive mechanical and ultrasonic testing is performed before delivery to ensure the material meets the specifications. Each delivery is fully documented through SSAB's certificate system that produces, distributes and records all types of inspection documents electronically. The certification system enables inspection documents to be handled quickly and easily.

## Quality management

The quality management system at SSAB is based on EN ISO 9001:2000 and is described in our "Operational Manual for Quality and Environment". An accredited inspection body certifies the system, and it is also certified in accordance with AQAP 2110:2. SSAB products conform to the requirements for CE marking according to the provisions of the EU Construction Products Directive (89/106/EEC).

## Priming, packing and marking

Strenx steel products are available with a wide range of priming, packing and marking options, such as anti-corrosion shop primer, durable plastic wrapping, edge protection, self-adhesive product labeling and non-perishable marking for product identification.

THE BEAUTY OF STRENX:

# SUPPORTS EXCELLENCE

My Inner Strenx is a program that enables manufacturers of high-end steel products to become stronger and more successful. It is also a way for users to have products made with superior steel and quality controlled production techniques.

Being a member of My Inner Strenx brings many benefits for companies with a drive to make the best possible products using Strenx high strength structural steel.

For starters, members have priority access to a wide range of SSAB services and resources for design, development and the production of existing and new products. SSAB Tech Support shares the latest in product knowledge and workshop practices with member companies. Members also have a direct channel to the SSAB Knowledge Service Center for new innovative ways to design with Strenx steel.

Other member benefits include a Technical Development hotline, the opportunity to take part in regular design and technical seminars on Strenx applications, direct access to SSAB Shape business advisors, and support in brand building and marketing to users.

Before becoming members, companies are evaluated and approved by SSAB. They are permitted to place the official My Inner Strenx sign on certified products as a proud display of outstanding quality and performance.

The sign shows their customers that the product has been optimized to be strong and light, made with Strenx structural steel and manufactured according to SSAB certified design and material specifications.

My Inner Strenx is good business for all parties involved. Apply now, and stay ahead of your competition.



MY INNER  
**STRENX**



SSAB is a Nordic and US-based steel company. SSAB offers value added products and services developed in close cooperation with its customers to create a stronger, lighter and more sustainable world. SSAB has employees in over 50 countries. SSAB has production facilities in Sweden, Finland and the US. SSAB is listed on the Nasdaq OMX Nordic Exchange in Stockholm and has a secondary listing on the Nasdaq OMX in Helsinki.

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