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® performance steel is our solution to this challenge. We call it performance steel, because it adds performance beyond ordinary high strength steel.

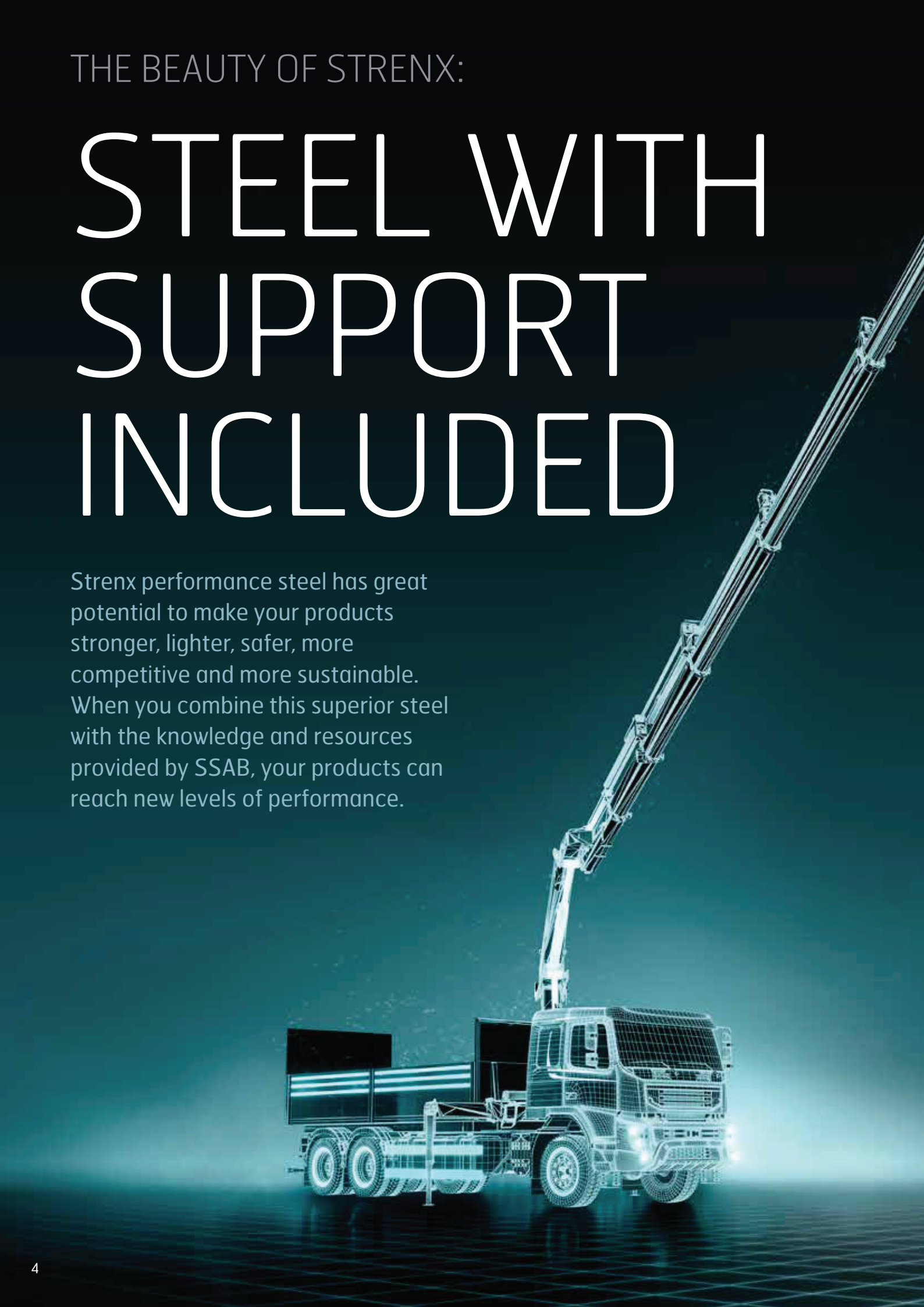
With Strenx steel, trailer manufacturers can specify more payload. Truck owners can cut down on fuel consumption and CO_2 emissions. Crane operators can improve their business by reaching higher and further. Farmers can cover more acres in a day.

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

THE BEAUTY OF STRENX:

STEEL WITH SUPPORT INCLUDED

Strenx performance 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.

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 performance 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 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 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...

FROM 600 TO 1300* MPa

If you have ever thought that all steel is basically the same, Strenx performance 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 $R_{p\,0.2}$, min [MPa]	Tensile strength $R_m$min [MPa]	Elongation A_5 min %	Bendability Minimum punch radius R/t, transverse to rolling direction, 8 ≤ t < 15 mm	CET/$CEV_{Typical}$ 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			
	5-40	1100	1250-1550	10	3.0	0.36/0.55	27
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 $R_{p\,0.2}$, min [MPa]	Tensile strength $R_m$min [MPa]	Elongation A_5 min %	Bending radius [R/t] 3 < t ≤ 6 mm	CET/$CEV_{Typical}$	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	930-1200	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	1250-1450	7	4.0	0.56/0.33	27 (-40°C)

Strenx cold rolled products

Name	Thickness range [mm]	Yield strength $R_{p\,0.2}$, min [MPa]	Tensile strength $R_m$min [MPa]	Elongation A_{80} min %	Bending radius [R/t]	CET/$CEV_{Typical}$
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 $R_{p\,0.2}$, min [MPa]	Tensile strength $R_m$min [MPa]	Elongation A_5 min %	CET/$CEV_{Typical}$	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 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 can make lifting equipment more competitive through increased reach both upwards and outwards. Smart design utilizes the high yield strength of Strenx 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 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 cleanness, 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

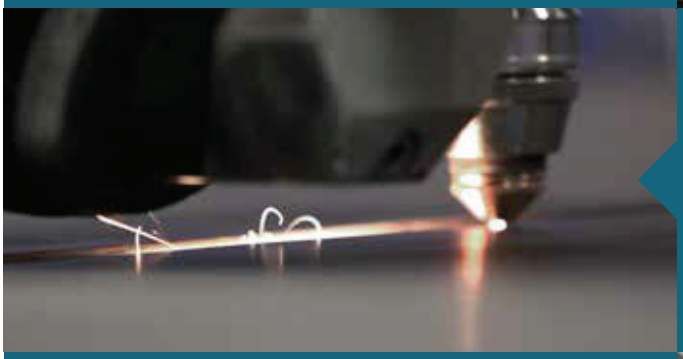
Strenx has five classes of flatness tolerances, depending on the type of product and material strength. All classes conform to or are more stringent than specified in EN 10 029. Class A and B also conform to or are stricter than specified in EN 10 051.

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.

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 performance steel.

Through our SSAB Shape centers we offer a wide range of services for the development and prefabrication of high strength steel parts. Strenx 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.

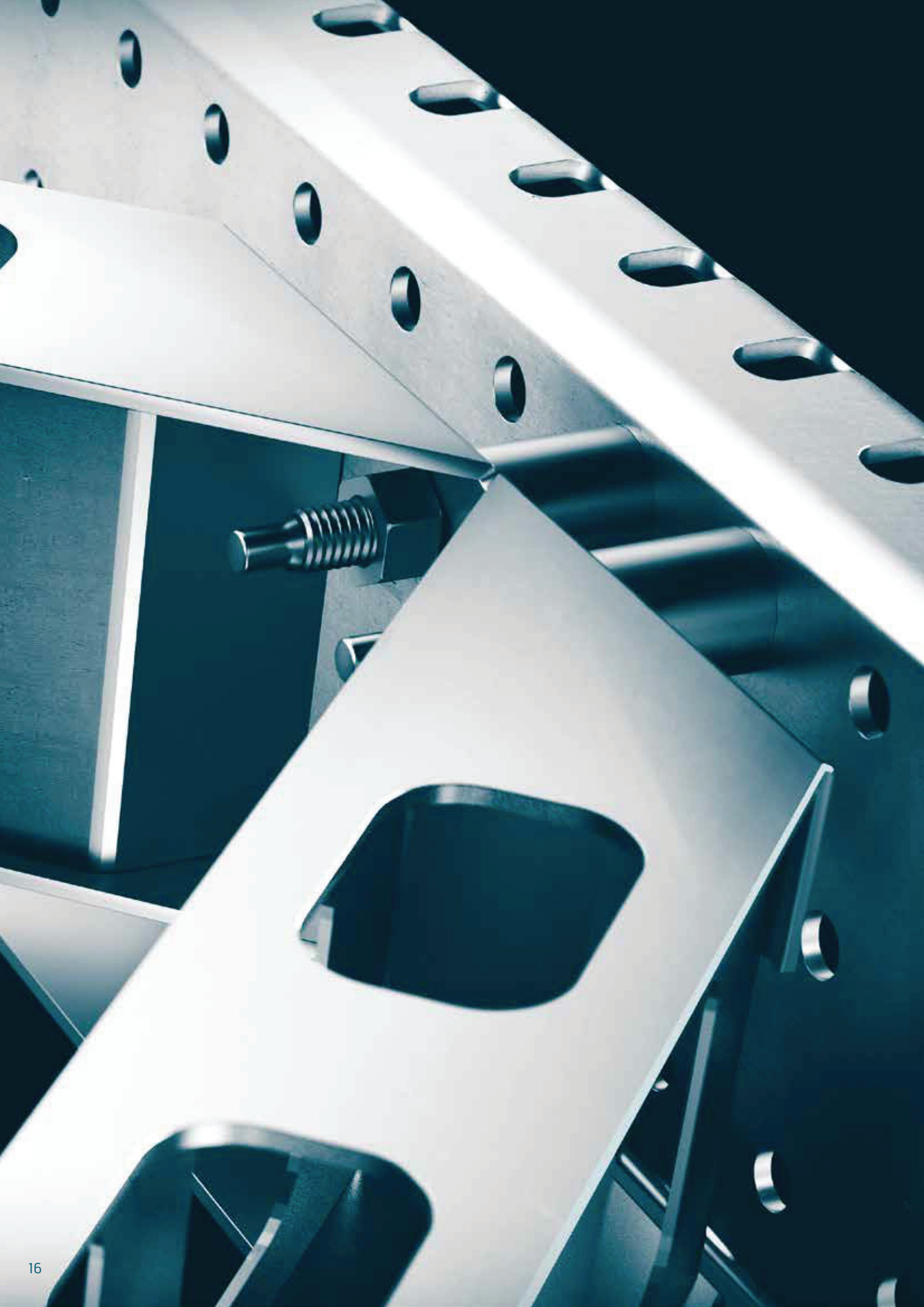
Processing services

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 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 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 quality 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 performance steel.

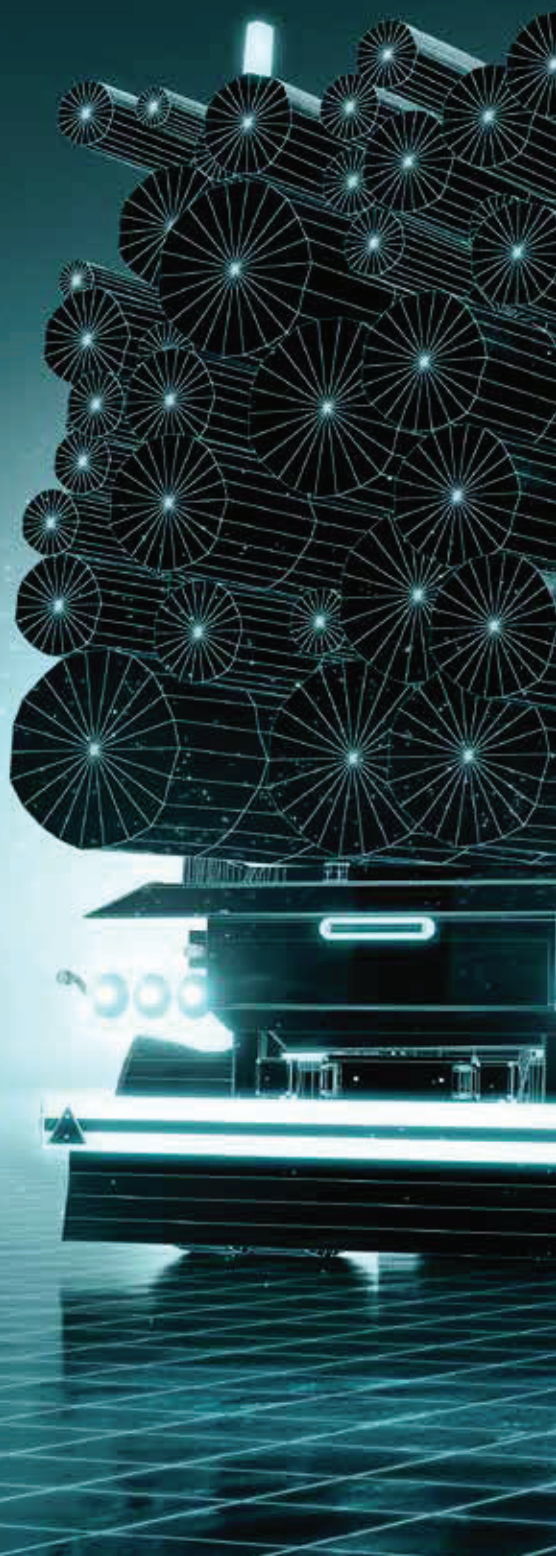
For starters, members have priority access to a wide range of SSAB services and resources for design, development and the production of existing and new products. SSAB Tech Support shares the latest in product knowledge and workshop practices with member companies. Members also have a direct channel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

STRENX®
PERFORMANCE STEEL

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.

400-en-Strenx: The Beauty V2 - 2016 A plus M

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SSAB

STRENX™
PERFORMANCE STEEL

STRENX 600 MC

General Product Description

The high-strength structural steel at 600 MPa
Strenx™ 600 MC is a hot-rolled structural steel made for cold forming, with a minimum yield strength of 600 MPa for stronger and lighter structures.
Strenx 600 MC meets or exceeds the requirements of S600MC in EN 10149-2.
Typical applications include a wide range of components and parts, such as demanding load-bearing structures. Strenx 600 MC comes in coils, slit coils or cut-to-length sheets.

Dimension Range
Strenx 600 MC is available in thicknesses of 2.00-10.00 mm and widths up to 1600 mm as coils, slit coils or cut to length sheets in lengths up to 16 meters.

Mechanical Properties

Thickness (mm)	Yield strength R_{eH} [1)] (min MPa)	Tensile strength R_m (MPa)	Elongation A_{80} [2)] (min %)	Elongation A_5 (min %)	Min. inner bending radius for a 90° bend [4)]
2.00- 3.00	600	650- 820	13	16 [3)]	0.7 x t
3.01- 6	600	650- 820		16	1.1 x t
6.01- 10	600	650- 820		16	1.4 x t

The mechanical properties are tested in the longitudinal direction.

1) If R_{eH} is not applicable then $R_{p\,0.2}$ is used.

2) A_{80} value applies for thicknesses < 3.00 mm

3) A_5 value applies for sheet thickness t ≥ 3mm.

4) For both longitudinal and transverse direction.

SSAB

STRENX 600 MC

Impact Properties

Grade	Min. impact energy for longitudinal testing Charpy V 10x10 mm test specimens	Test temperature
600 MC D	40 J	-20 °C
600 MC E	27 J	-40 °C

Impact testing according to EN ISO 148-1 is performed on thicknesses ≥ 6mm. The specified minimum value corresponds to a full-size specimen.

Chemical Composition (ladle analysis)

C (max %)	Si[1)] (max %)	Mn (max %)	P (max %)	S (max %)	Al_{tot} (min %)	Nb[2)] (max %)	V[2)] (max %)	Ti[2)] (max %)
0.12	0.21	1.90	0.025	0.010	0.015	0.09	0.20	0.15

[1)] If the material is to be hot-dip galvanized according to category A or category B in EN 10149-2 this must be specified at the time of order.Other galvanizing classes with higher Si-content are available after agreement.

[2)] Sum of Nb, V and Ti = max 0.22%

The steel is grain refined.

Carbon equivalent CET(CEV)

Thickness (mm)	2 - 10 mm
Typical CET (CEV)	0.21 (0.33)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees offer considerably narrower thickness tolerances compared to EN 10 051.

Length and Width
Width and length tolerances according to SSAB standard. The SSAB standard offer narrower width and length tolerances compared to EN 10 051. Length tolerances only apply for cut to length sheets.

Shape
Tolerances according to EN 10 051. Narrower tolerances according to the SSAB standard are available on request.

Flatness
Tolerances according to Strenx Flatness Guarantees™ Class A. Strenx Flatness Guarantees offer narrower tolerances compared to EN 10 051. Flatness guarantees only apply for cut to length sheets.

STRENX 600 MC

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

Delivery Conditions

Thermomechanically Rolled. Strenx 600 MC is available in as rolled or pickled surface condition with mill or cut edge.

Fabrication and Other Recommendations

Welding, bending and machining
Strenx 600 MC has good welding, cold forming and cutting performance.
Strenx 600 MC is a cold forming steel not suited for heat treatments at temperatures above 580°C since the material then may lose its guaranteed properties.
For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult our Tech Support, techsupport@ssab.com.
Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

2015-11-05

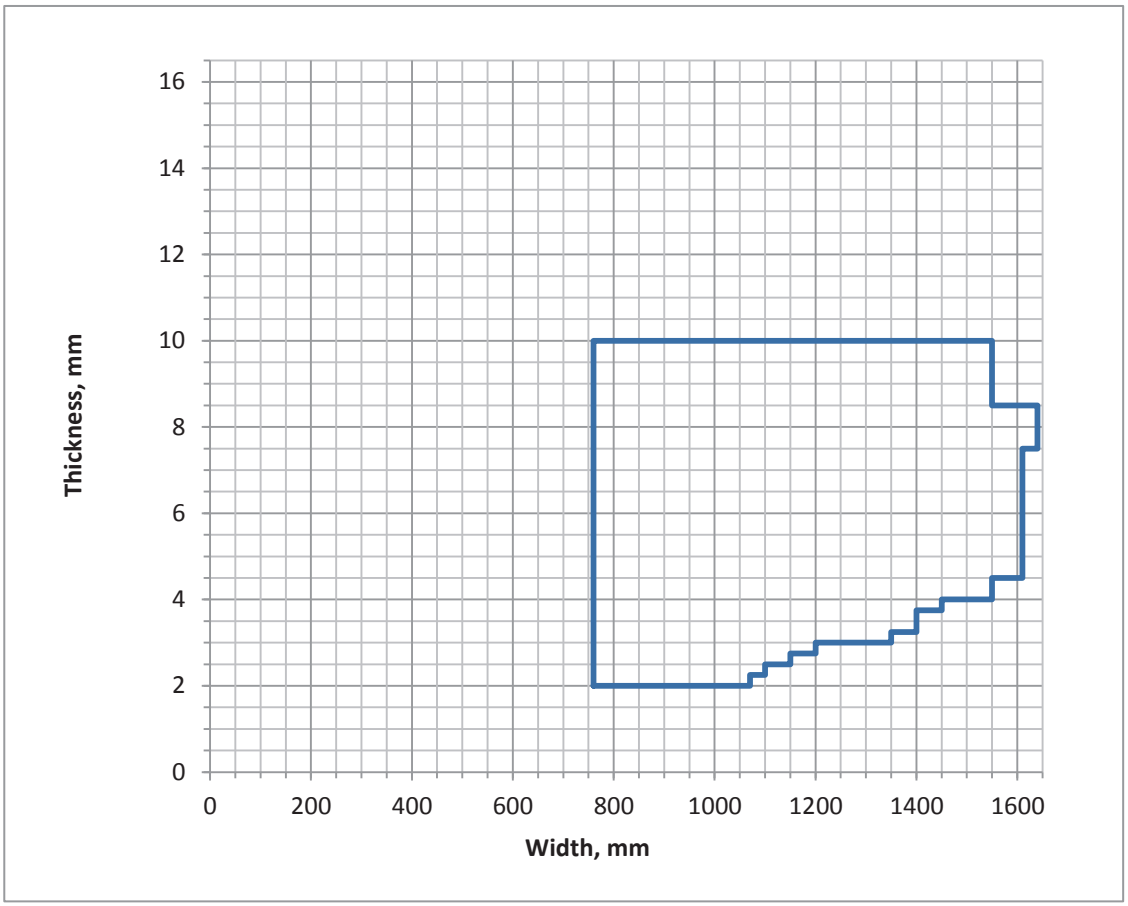
Product program

STRENX 600 MC D

Hot rolled wide strip in sheets can be provided with respect to the following requirements

- Steel grade..... STRENX 600 MC D
- Edge condition..... Mill edge
- Surface condition..... As rolled

In dimensions according to the following diagram:



Other requirements may impose further restrictions in addition to what have been specified above.

SSAB

STRENX™
PERFORMANCE STEEL

STRENX 650 MC

General Product Description

The high-strength structural steel at 650 MPa
Strenx™ 650 MC is a hot-rolled structural steel made for cold forming, with a minimum yield strength of 650 MPa for stronger and lighter structures.
Strenx 650 MC meets or exceeds the requirements of S650MC in EN 10149-2.
Typical applications include a wide range of components and parts, such as demanding load-bearing structures. Strenx 650 MC comes in coils, slit coils or cut-to-length sheets.

Dimension Range
Strenx 650 MC is available in thicknesses of 2.00-10.00 mm and widths up to 1600 mm as coils, slit coils or cut to length sheets in lengths up to 16 meters.

Mechanical Properties

Thickness (mm)	Yield strength R_{eH} [1)2)] (min MPa)	Tensile strength R_m (MPa)	Elongation A_{80} [3)] (min %)	Elongation A_5 (min %)	Min. inner bending radius for a 90 ° bend[5)]
2- 3	650	700- 850	12	14 [4)]	0.8 x t
3.01- 6	650	700- 850		14	1.2 x t
6.01- 10	650	700- 850		14	1.5 x t

The mechanical properties are tested in the longitudinal direction.

[1)] If R_{eH} is not applicable then Rp 0,2 is used.

[2)] On thicknesses >8 mm the minimum yield strength may be 20MPa lower.

[3)] A_{80} value applies for thicknesses < 3.00 mm.

[4)] A_5 value applies for sheet thickness t ≥ 3mm.

[5)] For both longitudinal and transverse direction.

SSAB

STRENX 650 MC

Impact Properties

Grade	Min. impact energy for longitudinal testing Charpy V 10x10 mm test specimens	Test temperature
Strenx 650 MC D	40 J	-20 °C
Strenx 650 MC E	27 J	-40 °C

Impact testing according to EN ISO 148-1 is performed on thicknesses ≥ 6mm. The specified minimum value corresponds to a full-size specimen.

Chemical Composition (ladle analysis)

C (max %)	Si[1] (max %)	Mn (max %)	P (max %)	S (max %)	Al_{tot} (min %)	Nb[2] (max %)	V[2] (max %)	Ti[2] (max %)
0.12	0.21	2.00	0.025	0.010	0.015	0.09	0.20	0.15

[1] If the material is to be hot-dip galvanized according to category A or category B in EN 10149-2 this must be specified at the time of order. Other galvanizing classes with higher Si-content are available after agreement.

[2] Sum of Nb, V and Ti = max 0.22%

The steel is grain refined.

Carbon equivalent CET(CEV)

Thickness (mm)	2 - 10 mm
CET (CEV)	0.22 (.034)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness

Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees offer considerably narrower thickness tolerances compared to EN 10 051.

Length and Width

Width and length tolerances according to SSAB standard. The SSAB standard offer narrower width and length tolerances compared to EN 10 051. Length tolerances only apply for cut to length sheets.

Shape

Tolerances according to EN 10 051. Narrower tolerances according to the SSAB standard are available on request.

Flatness

Tolerances according to Strenx Flatness Guarantees™ Class A. Strenx Flatness Guarantees offer narrower tolerances compared to EN 10 051. Flatness guarantees only apply for cut to length sheets.

STRENX 650 MC

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

Delivery Conditions

Thermomechanically Rolled. Strenx 650 MC is available in as rolled or pickled surface condition with mill or cut edge.

Fabrication and Other Recommendations

Welding, bending and machining
Strenx 650 MC has good welding, cold forming and cutting performance.
Strenx 650 MC is a cold forming steel not suited for heat treatments at temperatures above 580°C since the material then may lose its guaranteed properties.
For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult our Tech Support, techsupport@ssab.com.
Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

2015-11-05

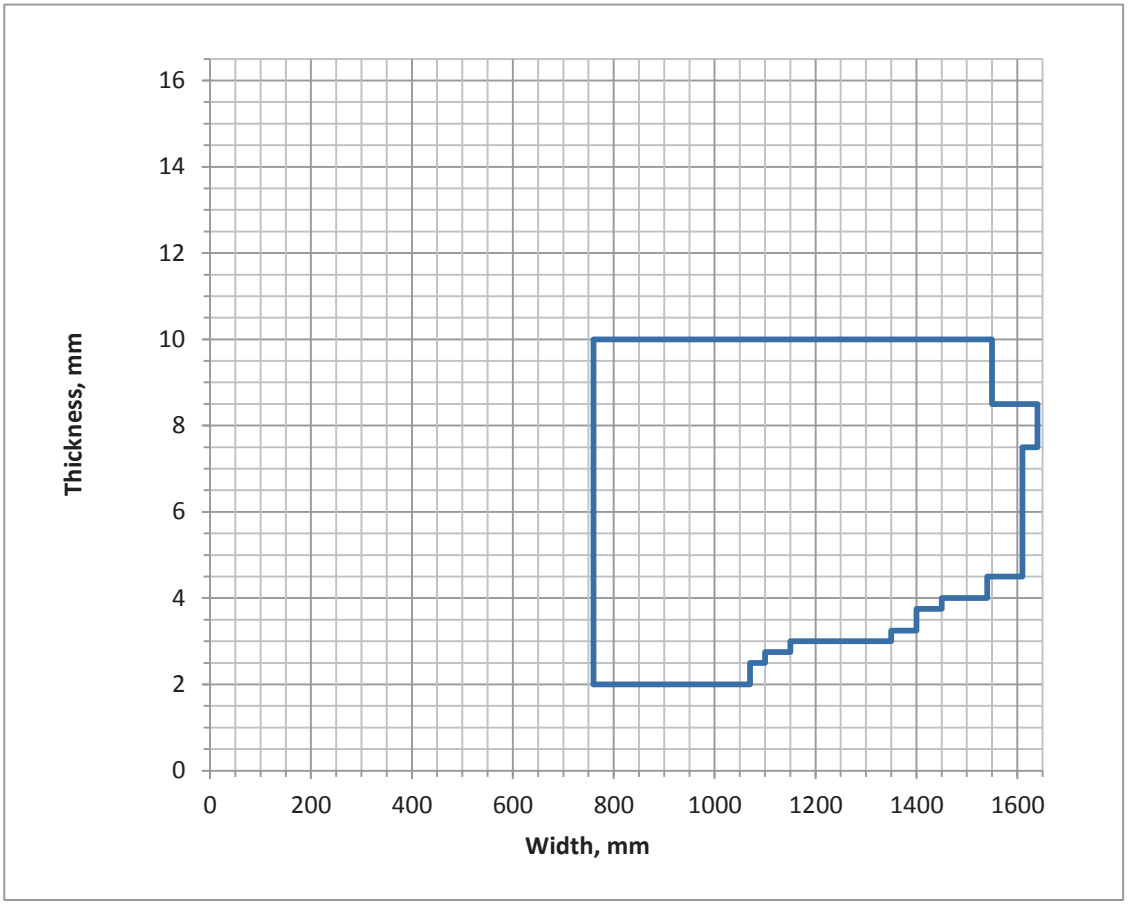
Product program

STRENX 650 MC D

Hot rolled wide strip in sheets can be provided with respect to the following requirements

- Steel grade..... STRENX 650 MC D
- Edge condition..... Mill edge
- Surface condition..... As rolled

In dimensions according to the following diagram:



Other requirements may impose further restrictions in addition to what have been specified above. The SSAB product configurator provides information about available options

STRENX™
PERFORMANCE STEEL

STRENX 700

General Product Description

The high-strength structural steel at 650-700 MPa
Strenx™ 700 is a structural steel with a minimum yield strength of 650-700 MPa depending on thickness.
Strenx 700 meets the requirements of EN 10 025-6 for the S690 grade and thicknesses. Typical applications include demanding load-bearing structures.
Strenx 700 E (complies with S 690 QL) is available in plate thicknesses of 4–160 mm, while Strenx 700 F (complies with S 690 QL1) is available in plate thicknesses of 4–130 mm.
Benefits include:

- Superior bendability and surface quality
- Weldability with excellent HAZ strength and toughness
- Exceptional consistency within a plate guaranteed by close tolerances
- High impact toughness which provides for good resistance to fractures

Dimension Range
Strenx 700 E is available in plate thicknesses of 4 – 160 mm and Strenx 700 F is available in plate thicknesses of 4- 130 mm. Both grades are available in widths up to 3350 mm and lengths up to 14630 mm depending on thickness. More detailed information on dimensions is provided in the dimension program

Mechanical Properties

Thickness (mm)	Yield strength[1)] $R_{p0.2}$ (min Mpa)	Tensile strength[1)] R_m (Mpa)	Elongation A_5 (min %)
4.0- 53.0	700	780- 930	14
53.1- 100.0	650	780- 930	14
100.1- 160.0	650	710- 900	14

[1)] For transverse test pieces according to EN 10 025.

SSAB

STRENX 700

Impact Properties

Grade	Min transverse test, impact energy, Charpy V 10x10 mm tests specimens[1)]	Meet Requirements For
Strenx 700 E	69 J/-40 ^{0}C	S 690 QL
Strenx 700 F	27J/-60 ^{0}C	S 690 QL1

[1)] Unless otherwise agreed, transverse impact testing according to EN 10025-6 option 30 will apply. For thicknesses between 6 - 11.9 mm, sub-size Charpy V-specimens are used. The specified minimum value is then proportrional to the cross-sectional area of the specimen compared to a full-size specimen (10 x 10 mm).

Chemical Composition (ladle analysis)

C *) (max %)	Si *) (max %)	Mn *) (max %)	P (max %)	S (max %)	Cr *) (max %)	Cu*) (max %)	Ni*) (max %)	Mo*) (max %)	B *) (max %)
0.20	0.60	1.60	0.020	0.010	0.80	0.30	2.0	0.70	0.005

The steel is grain refined. *) Intentional alloying elements.

Maximum Carbon Equivalent CET(CEV)

Thickness (mm)	4.0 - 5.0	5.1 - 30.0	30.1 - 60.0	60.1 - 100.0	100.1 - 130.0	130.1 - 160
700 E CET(CEV)	0.34 (0.48)	0.32 (0.49)	0.36 (0.52)	0.39 (0.58)	0.41 (0.67)	0.43 (0.73)
700 F CET(CEV)	0.38 (0.57)	0.38 (0.57)	0.39 (0.58)	0.39 (0.58)	0.41 (0.67)	-

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given in SSAB's brochures 41-General product information Strenx, Hardox, Armox and Toolox-UK and Strenx™ Guarantees or on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees.
Strenx Guarantees meet the requirements of EN 10 029 Class A, but offers narrower tolerances.

Length and Width
According to SSAB's dimension program. Tolerances conform with EN 10 029 or to SSAB's standard after agreement.

Shape
SSAB offers tolerances according to EN 10 029

Flatness
Tolerances according to Strenx Flatness Guarantee Class C, which are more narrow than EN 10 029 Class N.

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

STRENX 700

Bending
Tolerances according to Strenx Bending Guarantee Class A.

Delivery Conditions

The delivery condition is Q+T (Quenched and Tempered). The plates are delivered with sheared or thermally cut edges. Untrimmed edges after agreement. Delivery requirements can be found in SSAB's brochure 41-General product information Strenx, Hardox, Armox and Toolox-UK or on www.ssab.com.

Fabrication and Other Recommendations

Welding, bending and machining
Recommendations are found in SSAB's brochures at www.ssab.com or consult Tech Support, techsupport@ssab.com.
Strenx 700 has obtained its mechanical properties by quenching and subsequent tempering. The properties of the delivery condition cannot be retained after exposure to temperatures in excess of 580ºC.
Appropriate health and safety precautions must be taken when welding, cutting, grinding or otherwise working on this product. Grinding, especially of primer coated plates, may produce dust with a high particle concentration.

Strenx 700

2015-11-05

The table shows available dimensions for direct order including the maximum length (mm)

Some restrictions, contact your local sales representative for more information

Only 1650 mm width, mill edges. Other dimensions must be approved by Product Manager Strenx
For thermally cut edges, contact local sales force

Outside the range of dimensions

Minimum length: 2000 mm

Minimum quantities:

Thickness:	Minimum position weight:
3.0-60.0	2.5 tons
60.1-100,0	3.5 tons
100.1-120.0	4.0 tons
120.1-	5.0 tons

Width (mm)	1000-	-1351	1500	1501	1600	-1601	-1700	-1801	-1901	-2001	-2101	-2201	-2301	-2401	-2501	-2601	-2701	-2801	-2901	-3001	-3101	-3201	-3301
Thickness (mm)	1350	1499		1599		1699	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000	3100	3200	3300	3350
3.0 - 3.9																							
4.0 - 4.7																							
4.8 - 5.7																							
5.8 - 6.0																							
6.1 - 6.7																							
6.8 - 7.7																							
7.8 - 8.7																							
8.8 - 10.0																							
10.1 - 25.0																							
25.1 - 26.0																							14600
26.1 - 27.0																						14200	14000
27.1 - 28.0																					14200	13700	13500
28.1 - 29.0																				14100	13700	13300	13100
29.1 - 30.0																			14100	13600	13200	12800	12600
30.1 - 31.0																		14100	13600	13200	12800	12400	12200
31.1 - 32.0						Maximum length 14630 mm											14200	13700	13200	12800	12400	12000	11800
32.1 - 33.0	14200															14200	13700	13300	12800	12400	12000	11600	11500
33.1 - 34.0	13800														14400	13800	13300	12900	12400	12000	11700	11300	11100
34.1 - 35.0	13400													14500	13900	13400	12900	12500	12100	11700	11300	11000	10800
35.1 - 36.0	13100													14100	13600	13100	12600	12200	11700	11400	11000	10700	10500
36.1 - 37.0	12700												14300	13700	13200	12700	12200	11800	11400	11100	10700	10400	10200
37.1 - 38.0	12400											14500	13900	13400	12800	12400	11900	11500	11100	10800	10400	10100	10000
38.1 - 39.0	12000											14200	13600	13000	12500	12000	11600	11200	10800	10500	10200	9800	9700
39.1 - 40.0	11700										14400	13800	13200	12700	12200	11700	11300	10900	10600	10200	9900	9600	9500
40.1 - 45.0	10400								14100	13400	12800	12300	11700	11300	10800	10400	10100	9700	9400	9100	8800	8500	8400
45.1 - 50.0	9400						14100	13400	12700	12100	11500	11000	10600	10100	9700	9400	9000	8700	8400	8200	7900	7700	7600
50.1 - 55.0	9000			14400	14400	13600	12800	12100	11500	11000	10500	10000	9600	9200	9000	9000	9000	7900	7700	7400	7200	7000	6900
55.1 - 60.0	8600	14100	14100	13200	13200	12400	11700	11100	10600	10100	9600	9200	9000	9000	8900	8600	8300	7300	7000	6800	6600	6400	6300
60.1 - 65.0	7900	13000	13000	11200	11200	11200	10800	10300	9700	9300	9000	9000	8900	8500	8200	7900	7600	6700	6500	6300			
65.1 - 70.0	7300	12100	12100	11200	11200	11000	10100	9500	9000	9000	8900	8600	8200	7900	7600	7300	7000	6200					
70.1 - 75.0	6800	11300	11300	10600	10600	11000	9400	9000	9000	8700	8300	7900	7600	7300	7000	6800	6500						
75.1 - 80.0	6300	10600	10600	9900	9900	11000	9000	8900	8500	8100	7700	7400	7100	6800	6600	6300	6100						
80.1 - 85.0	5900	9900	9900	9300	9300	11000	8800	8400	8000	7600	7300	6900	6700	6400	6100	5900	5700						
85.1 - 90.0	5500	9400	9400	9000	9000	11000	8300	7900	7500	7200	6800	6500	6300	6000	5800	5500	5300						
90.1 - 95.0	5200	9000	9000	8800	8800	11000	7900	7400	7100	6700	6400	6200	5900	5700	5400	5200	5000						
95.1 - 100.0	4900	8900	8900	8300	8300	11000	7400	7000	6700	6400	6100	5800	5600	5300	5100	4900	4800						
100.1 - 105.0	4700	8400	8400	7900	7900	10500	7100	6700	6400	6100	5800	5500	5300	5100	4900	4700	4500						
105.1 - 110.0	4400	8000	8000	7500	7500	10500	6700	6400	6000	5800	5500	5200	5000	4800	4600	4400	4300						
110.1 - 115.0	4200	7600	7600	7200	7200	10500	6400	6100	5800	5500	5200	5000	4800	4600	4400	4200	4100						
115.1 - 120.0	4000	7300	7300	6800	6800	10500	6100	5800	5500	5200	5000	4800	4600	4400	4200	4000	3900						
120.1 - 125.0	3800	7000	7000	6600	6600	10500	5800	5500	5200	5000	4800	4500	4400	4200	4000	3800	3700						
125.1 - 130.0	3700	6700	6700	6300	6300	10500	5600	5300	5000	4800	4600	4400	4200	4000	3800	3700							
130.1 - 135.0		6400	6400	6000	6000	9900	5400	5100	4800	4600	4400	4200	4000	3800									
135.1 - 140.0		6200	6200	5800	5800	9900	5200	4900	4600														
140.1 - 145.0						9300																	
145.1 - 150.0						9300																	
150.1 - 155.0						8700																	
155.1 - 160.0						8700																	

SSAB

STRENX™
PERFORMANCE STEEL

STRENX 700 MC

General Product Description

The high-strength structural steel at 700 MPa
Strenx™ 700 MC is a hot-rolled structural steel made for cold forming, with a minimum yield strength of 700 MPa for stronger and lighter structures.
Strenx 700 MC meets or exceeds the requirements of S700MC in EN 10149-2. Typical applications include a wide range of components and parts in demanding load-bearing structures.
Strenx 700 MC comes in coils, slit coils or cut-to-length sheets.

Dimension Range
Strenx 700 MC is available in thicknesses of 2.00-10.00 mm and widths up to 1600 mm as coils, slit coils or cut to length sheets in lengths up to 16 meters.

Mechanical Properties

Thickness (mm)	Yield strength R_{eH} [1)2)] (min MPa)	Tensile strength R_m (MPa)	Elongation A_{80} [4)] (min %)	Elongation A_5 (min %)	Min. inner bending radius for a 90° bend[3)]
2- 3	700	750- 950	10	12 [5)]	0.8 x t
3.01- 6	700	750- 950		12	1.2 x t
6.01- 10	700	750- 950		12	1.6 x t

The mechanical properties are tested in the longitudinal direction.

[1)] If ReH is not applicable then Rp 0,2 is used.

[2)] On thicknesses >8 mm the minimum yield strength may be 20MPa lower.

[3)] For both longitudinal and transverse direction.

[4)] A_{80} value applies for sheet thickness < 3.00 mm

[5)] A_5 value applies for sheet thickness t ≥ 3mm.

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STRENX 700 MC

Impact Properties

Grade	Min. impact energy for longitudinal testing Charpy V 10x10 mm test specimens	Test temperature
700 MC D	40 J	-20 °C
700 MC E	27 J	-40 °C

Impact testing according to EN ISO 148-1 is performed on thicknesses ≥ 6mm. The specified minimum value corresponds to a full-size specimen.

Chemical Composition (ladle analysis)

C (max %)	Si[1)] (max %)	Mn (max %)	P (max %)	S (max %)	Al_{tot} (min %)	Nb[2)] (max %)	V[2)] (max %)	Ti[2)] (max %)
0.12	0.21	2.10	0.020	0.010	0.015	0.09	0.20	0.15

[1)] If the material is to be hot-dip galvanized according to category A or category B in EN 10149-2 this must be specified at the time of order. Other galvanizing classes with higher Si-content are available after agreement.

[2)] Sum of Nb, V and Ti = max 0.22%

The steel is grain refined.

Carbon equivalent CET(CEV)

Thickness (mm)	2 - 10
Typical CET (CEV)	0.25 (0.39)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees offer considerably narrower thickness tolerances compared to EN 10 051.

Length and Width
Width and length tolerances according to SSAB standard. The SSAB standard offer narrower width and length tolerances compared to EN 10 051. Length tolerances only apply for cut to length sheets.

Shape
Tolerances according to EN 10 051. Narrower tolerances according to the SSAB standard are available on request.

Flatness
Tolerances according to Strenx Flatness Guarantees Class A. Strenx Flatness Guarantees offer narrower tolerances compared to EN 10 051. Flatness guarantees only apply for cut to length sheets.

STRENX 700 MC

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

Delivery Conditions

Thermomechanically Rolled. Strenx 700 MC is available in as rolled or pickled surface condition with mill or cut edge.

Fabrication and Other Recommendations

Welding, bending and machining
Strenx 700 MC has good welding, cold forming and cutting performance.
Strenx 700 MC is a cold forming steel not suited for heat treatments at temperatures above 580°C since the material then may lose its guaranteed properties.
For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult Tech Support, techsupport@ssab.com.
Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

2015-11-05

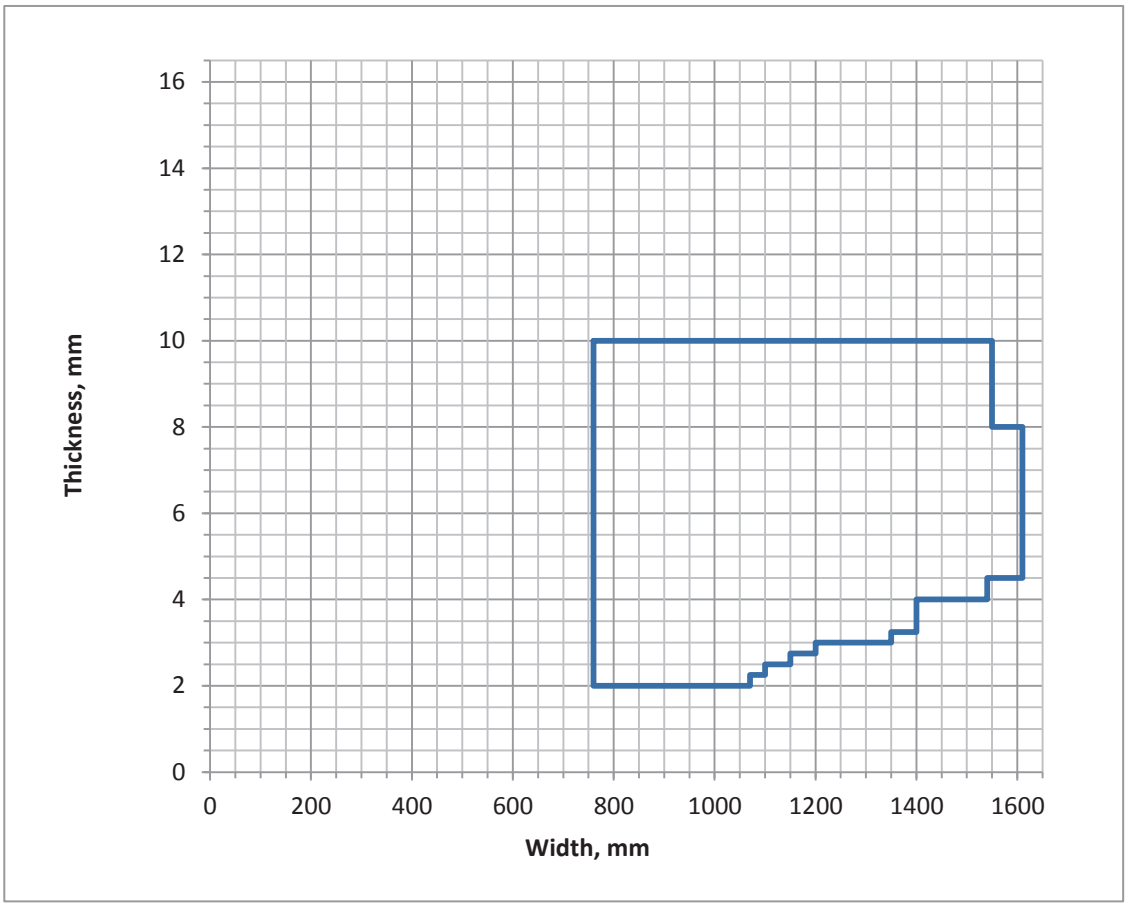
Product program

STRENX 700 MC D

Hot rolled wide strip in sheets can be provided with respect to the following requirements

- Steel grade..... STRENX 700 MC D
- Edge condition..... Mill edge
- Surface condition..... As rolled

In dimensions according to the following diagram:



Other requirements may impose further restrictions in addition to what have been specified above.

STRENX™
PERFORMANCE STEEL

STRENX 700 MC PLUS

General Product Description

The high-strength structural steel with excellent formability
Strenx™ 700 MC Plus is a high-strength structural steel with advanced cold formability and impact toughness for highly demanding applications.
Strenx 700 MC Plus meets or exceeds the requirements of S700MC in EN 10149-2. It is typically used in highly demanding applications that require superior bendability, high impact toughness in cold conditions and the ability to cut mechanically.
Strenx 700 MC Plus comes in cut-to-length sheets.

Dimension Range
Strenx 700 MC Plus is available as cut to length sheets in thicknesses of 3.00-12.00 mm, widths up to 1525 mm and lengths up to 13 meters.

Mechanical Properties

Thickness (mm)	Yield strength R_{eH} [1)2)] (min MPa)	Tensile strength R_m (MPa)	Elongation A_5 (min %)	Min. inner bending radius for a 90° bend[3)]
3- 10	700	750- 950	13	1.0 x t
10.01- 12	700	750- 950	13	1.5 x t

The mechanical properties are tested in the longitudinal direction.

[1)] If ReH is not applicable then Rp 0,2 is used.

[2)] On thicknesses >8 mm the minimum yield strength may be 20MPa lower.

[3)] For both longitudinal and transverse direction.

Impact Properties

Minimum energy for test on longitudinal Charpy V 10x10 mm test specimens	Test temperature
40 J	-60 °C

Impact testing in the transverse direction is available if specified at the time of order.

Impact testing according to EN ISO 148-1 is performed on thicknesses ≥ 5mm. The specified minimum value corresponds to a full-size specimen.

SSAB

STRENX 700 MC PLUS

Chemical Composition (ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Al_{tot} (min %)	Nb[1)] (max %)	V[1)] (max %)	Ti[1)] (max %)
0.12	0.25	2.10	0.020	0.010	0.015	0.09	0.20	0.15

The steel is grain refined.

[2)] Sum of Nb, V and Ti = max 0.22%

Carbon equivalent CET(CEV)

Thickness (mm)	3 - 11.49	11.50 - 12
Typical CET (CEV)	0.24 (0.38)	0.26 (0.40)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees offer considerably narrower thickness tolerances compared to EN 10 051.

Length and Width
Width and length tolerances according to SSAB standard. The SSAB standard offer narrower width and length tolerances compared to EN 10 051. Length tolerances only apply for cut to length sheets.

Shape
Tolerances according to EN 10 051. Narrower tolerances according to the SSAB standard are available on request.

Flatness
Tolerances according to Strenx Flatness Guarantees Class A. Strenx Flatness Guarantees offer narrower tolerances compared to EN 10 051. Flatness guarantees only apply for cut to length sheets.

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

Delivery Conditions

Thermomechanically Rolled. Strenx 700 MC Plus is available in as rolled or pickled surface condition.

Fabrication and Other Recommendations

Welding, bending and machining

STRENX 700 MC PLUS

Strenx 700 MC Plus has good welding, cold forming and cutting performance.
Strenx 700 MC Plus is a cold forming steel not suited for heat treatments at temperatures above 580°C since the material then may lose its guaranteed properties.
For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult Tech Support, techsupport@ssab.com.
Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

2015-11-05

Product program

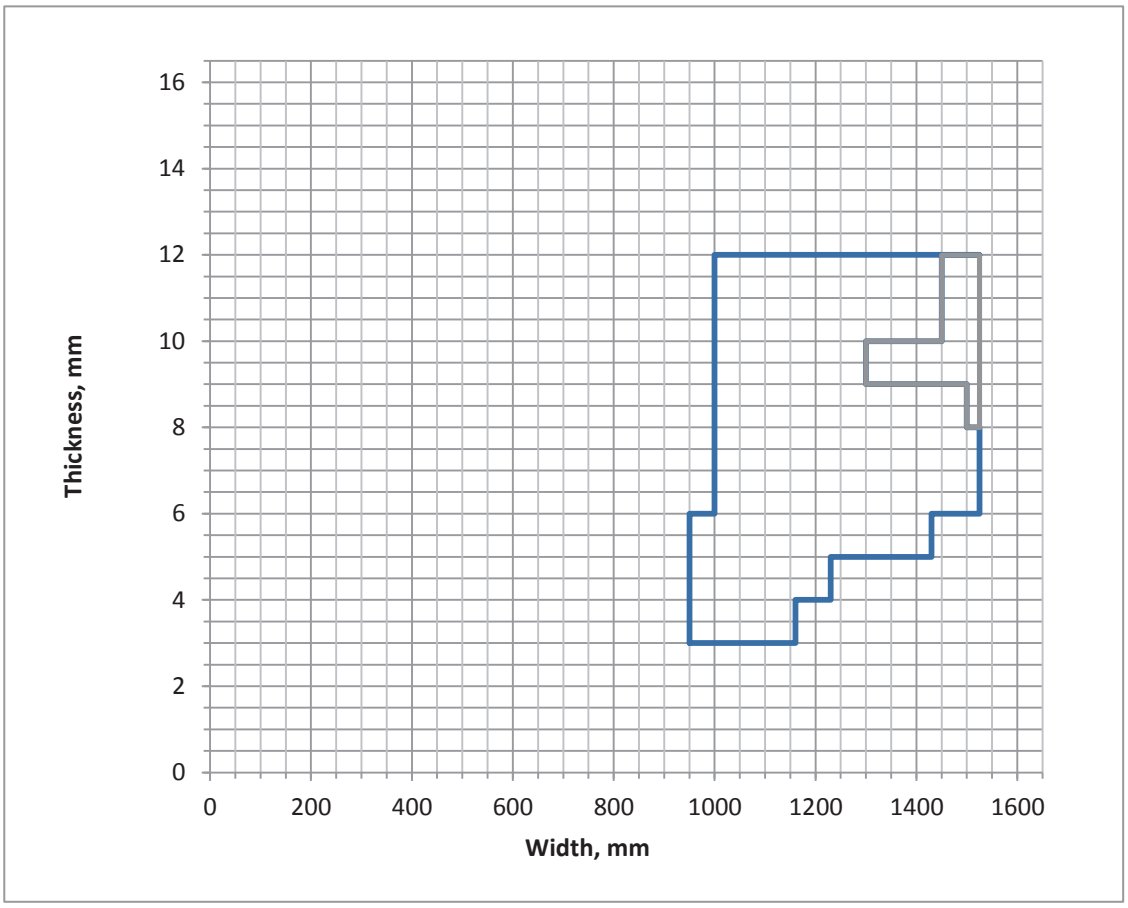
STRENX 700 MC Plus

Hot rolled wide strip in sheets can be provided with respect to the following requirements

- Steel grade..... STRENX 700 MC Plus
- Edge condition..... Mill edge
- Surface condition..... As rolled

Some restrictions

In dimensions according to the following diagram:



Other requirements may impose further restrictions in addition to what have been specified above.

SSAB

STRENX™
PERFORMANCE STEEL

STRENX 700 CR

General Product Description

The high-strength structural steel at 700 MPa
Strenx 700 CR is a cold-rolled structural steel with a minimum yield strength of 700 MPa used to produce stronger and lighter structures.
Strenx 700 CR comes in cut-to-length sheets. Typical applications include a wide range of components and parts, for example load-bearing structures.

Dimension Range
Strenx 700 CR is available as cut to length sheets in thicknesses of 0.70-2.10 mm, widths up to 1500 mm and in lengths up to 8.5 meters.

Mechanical Properties

Yield strength $R_{p0.2}$ (min MPa)	Tensile strength R_m (MPa)	Elongation A_{80} (min %)	Min. inner bending radius for a 90° bend[1)]
700	1000- 1200	7	2.0 x t

The mechanical properties are tested in the longitudinal direction.
The mechanical properties are guaranteed in coil condition.
1) For both longitudinal and transverse direction.

Chemical Composition (ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Al (min %)	Nb+Ti (max %)
0.16	0.40	1.80	0.020	0.010	0.015	0.10

Carbon equivalent CET(CEV)

Thickness (mm)	0.7 - 2.1
Typical CET (CEV)	0.29 (0.40)

SSAB

STRENX 700 CR

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Thickness guarantees meet the normal thickness tolerance requirements of EN 10131.

Length and Width
Tolerances according to EN 10131. Narrower tolerances according to the SSAB standard are available on request. Length tolerances only apply for cut to length sheets.

Delivery Conditions

Cold rolled. Strenx 700 CR is available with mill or cut edge.

Fabrication and Other Recommendations

Welding, bending and machining
Strenx 700 CR has good cold forming, welding and cutting performance.
For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult Tech Support, techsupport@ssab.com.
Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

STRENX™
PERFORMANCE STEEL

STRENX 700 OME

General Product Description

A structural steel developed for use in demanding load-bearing structures within the Offshore and Marine Industry.
Strenx™ 700 OME exceeds the requirements of S690QL, EN 10 025-6. Strenx 700 OME can be ordered with dual steel grades certificate, where the additional steel grade is defined and approved by one of the Classification Societies listed below.
The dual certification offers You the benefits of excellent mechanical properties, extra tight tolerances, formability and consistency of SSAB Strenx Guarantees.

Classification society:

- American Bureau of Shipping	AB EQ70, 4.8 to 130 mm thickness.
- DNV- GL	NV E690, VL E690, 6 to 80 mm thickness.
- Lloyds Register	LR EH 69, 8 to 80 mm thickness.

Dimension Range
Strenx 700 OME is available in plate thicknesses of 4 – 130 mm and available in widths up to 3350 mm and lengths up to 14630 mm depending on thickness. More detailed information on dimensions is provided in the dimension program at www.ssab.com.

Mechanical Properties

Thickness (mm)	Yield strength[1)] $R_{p0.2}$ (min MPa)	Tensile strength[1)] R_m (MPa)	Elongation A_5 (min %)
4.0- 130.0	700	780- 930	14

[1)] For transverse test pieces according to EN 10 025.

Impact Properties

Grade	Min transverse test, impact energy, Charpy V 10x10 mm tests specimens[1)]
Strenx 700 OME	69 J/-40 ^{0}C

[1)] Unless otherwise agreed, only transverse impact testing.

SSAB

STRENX 700 OME

Additional Options for Mechanical properties:

Option 1- Min guaranteed impact energy (J) for transverse testing Charpy V 10x10 mm tests specimens 50 J/-60^{0}C.

Option 2- Improved deformation properties perpendicular to the surface. Through- thickness tensile testing according to EN 10 164, Class Z35, Z25 and Z15.

Chemical Composition (ladle analysis)

C *) (max %)	Si *) (%)	Mn *) (max %)	P (max %)	S (max %)	Cr *) (max %)	Cu*) (max %)	Ni*) (max %)	Mo*) (max %)	B *) (max %)
0.20	0.10- 0.55	1.60	0.015	0.003	0.80	0.30	2.0	0.70	0.005

The steel is grain refined. *) Intentional alloying elements.

Maximum Carbon Equivalent CET(CEV)

Thickness (mm)	4 - 30	(30) - 100	(100) - 130
Strenx 700 OME: CET(CEV)	0.38 (0.57)	0.39 (0.58)	0.41 (0.67)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given in SSAB's brochures 41-General product information Strenx, Hardox, Armox and Toolox-UK and Strenx™ Guarantees or on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees.
Strenx Guarantees meet the requirements of EN 10 029 Class A, but offers narrower tolerances.

Length and Width
According to SSAB's dimension program. Tolerances conform with EN 10 029 or to SSAB's standard after agreement.

Shape
SSAB offers tolerances according to EN 10 029.

Flatness
Tolerances according to Strenx Flatness Guarantee Class C, which are more narrow than EN 10 029 Class N.

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

STRENX 700 OME

Bending
Tolerances according to Strenx Bending Guarantee Class A.

Delivery Conditions

The delivery condition is Q+T (Quenched and Tempered). The plates are delivered with sheared or thermally cut edges. Untrimmed edges after agreement. Delivery requirements can be found in SSAB's brochure 41-General product information Strenx, Hardox, Armox and Toolox-UK or on www.ssab.com.

Fabrication and Other Recommendations

Welding, bending and machining.
Recommendations are found in SSAB's brochures at www.ssab.com or consult Tech Support, techsupport@ssab.com. Workshop guidelines for Strenx 700 OME refer to the same recommendations as for Strenx 700.

Strenx 700 OME has obtained its mechanical properties by quenching and subsequent tempering. The properties of the delivery condition cannot be retained after exposure to temperatures in excess of 580^{0}C.

Appropriate health and safety precautions must be taken when welding, cutting, grinding or otherwise working on this product. Grinding, especially of primer coated plates, may produce dust with a high particle concentration.

STRENX™
PERFORMANCE STEEL

STRENX 900

General Product Description

The high-strength structural steel at 900 MPa
Strenx™ 900 is a structural steel that guarantees a minimum yield strength of up to 900 MPa depending on thickness.
Strenx 900 provides a unique combination of strength and toughness together with first-rate workshop properties. Typical applications include load-bearing structures, where low weight is needed.
Strenx 900 meets the requirements of EN 10 025-6 for the S890 grade and thicknesses. Strenx 900E (complies with S 890 QL) is available in plate thicknesses of 4–100 mm, while Strenx 900F (complies with S 890 QL1) is available in the thickness range up to 80 mm. Benefits include:

- High impact toughness which provides for good resistance to fractures
- Superior bendability and surface quality
- Weldability with excellent HAZ strength and toughness
- Exceptional consistency within a plate guaranteed by close tolerances

Dimension Range
Strenx 900E is available in plate thicknesses of 4 – 100 mm and Strenx 900F is available in the thickness range up to 80 mm. Both grades are available in widths up to 3350 mm and lengths up to 14630 mm depending on thickness. More detailed information on dimensions is provided in the dimension program.

Mechanical Properties

Thickness (mm)	Yield strength $R_{p0.2}$ [1)] (min MPa)	Tensile strength R_m [1)] (MPa)	Elongation A_5 (min %)
4.0- 53.0	900	940- 1100	12
53.1- 100	830	880- 1100	12

[1)] For transverse test pieces according to EN 10 025.

SSAB

STRENX 900

Impact Properties

Grade	Min transverse test, impact energy, Charpy V 10x10 mm tests specimens[2)]	Meet Requirements For
Strenx 900 E	27 J/- 40 ^{0}C	S 890 QL
Strenx 900 F	27 J/- 60 ^{0}C	S 890 QL1

[2)] Unless otherwise agreed, transverse impact testing according to EN 10025-6 option 30 will apply. For thicknesses between 6-11.9 mm, sub-size Charpy V-specimens are used. The specified min value is then proportrional to the cross-sectional area of the specimen compared to a full-size specimen (10x10)

Chemical Composition (ladle analysis)

C *) (max %)	Si *) (max %)	Mn *) (max %)	P (max %)	S (max %)	Cr *) (max %)	Cu (max %)	Ni*) (max %)	Mo*) (max %)	B *) (max %)
0.20	0.50	1.60	0.020	0.010	0.80	0.3	2.0	0.70	0.005

The steel is grain refined. *) Intentional alloying elements.

Maximum Carbon equivalent CET(CEV)

Thickness (mm)	4.0 - 80.0 mm	80.1 - 100.0 mm
CET(CEV)	0.39 (0.58)	0.41 (0.63)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given in SSAB's brochures 41-General product information Strenx, Hardox, Armox and Toolox-UK and Strenx™ Guarantees or on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees meets the requirements of EN 10 029 Class A, but offers narrower tolerances.

Length and Width
According to SSAB's dimension program. Tolerances conform with EN 10 029 or to SSAB's standard after agreement.

Shape
SSAB offers tolerances according to EN 10 029.

Flatness
Tolerances according to Strenx Flatness Guarantee Class C, which are more narrow than EN 10 029 Class N.

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

Bending
Tolerances according to Strenx Bending Guarantee Class B.

STRENX 900

Delivery Conditions

The delivery condition is Q+T (Quenched and Tempered). The plates are delivered with sheared or thermally cut edges. Untrimmed edges after agreement. Delivery requirements can be found in SSAB's brochure 41-General product information Strenx, Hardox, Armox and Toolox-UK or on www.ssab.com.

Fabrication and Other Recommendations

Welding, bending and machining

Recommendations are found in SSAB's brochures at www.ssab.com or consult Tech Support, techsupport@ssab.com.
Strenx 900 has obtained its mechanical properties by quenching and subsequent tempering. The properties of the delivery condition cannot be retained after exposure to temperatures in excess of 550ºC.
Appropriate health and safety precautions must be taken when welding, cutting, grinding or otherwise working on this product. Grinding, especially of primer coated plates, may produce dust with a high particle concentration.

Strenx 900

2015-06-08

The table shows available dimensions for direct order including the maximum length (mm)

Some restrictions, contact your local sales representative for more information

Only 1650 mm width, mill edges. Other dimensions must be approved by Product Manager Strenx
For thermally cut edges, contact local sales force

Outside the range of dimensions

Minimum length: 2000 mm
Minimum quantities:

Thickness:	Minimum position weight:
3.0-60.0	2.5 tons
60.1-100,0	3.5 tons
100.1-120.0	4.0 tons
120.1-	5.0 tons

Width (mm)	1000-1350	-1351 1499	1500	1501 1599	1600	-1601 1699	-1700 1800	-1801 1900	-1901 2000	-2001 2100	-2101 2200	-2201 2300	-2301 2400	-2401 2500	-2501 2600	-2601 2700	-2701 2800	-2801 2900	-2901 3000	-3001 3100	-3101 3200	-3201 3300	-3301 3350
3.0 - 3.9																							
4.0 - 4.7																							
4.8 - 5.7																							
5.8 - 6.0																							
6.1 - 6.7																							
6.8 - 7.7																							
7.8 - 8.7																							
8.8 - 10.0																							
10.1 - 25.0																							
25.1 - 26.0																							14600
26.1 - 27.0																						14200	14000
27.1 - 28.0																					14200	13700	13500
28.1 - 29.0																				14100	13700	13300	13100
29.1 - 30.0																			14100	13600	13200	12800	12600
30.1 - 31.0																		14100	13600	13200	12800	12400	12200
31.1 - 32.0						Maximum length 14630 mm											14200	13700	13200	12800	12400	12000	11800
32.1 - 33.0	14200															14200	13700	13300	12800	12400	12000	11600	11500
33.1 - 34.0	13800														14400	13800	13300	12900	12400	12000	11700	11300	11100
34.1 - 35.0	13400													14500	13900	13400	12900	12500	12100	11700	11300	11000	10800
35.1 - 36.0	13100													14100	13600	13100	12600	12200	11700	11400	11000	10700	10500
36.1 - 37.0	12700												14300	13700	13200	12700	12200	11800	11400	11100	10700	10400	10200
37.1 - 38.0	12400											14500	13900	13400	12800	12400	11900	11500	11100	10800	10400	10100	10000
38.1 - 39.0	12000											14200	13600	13000	12500	12000	11600	11200	10800	10500	10200	9800	9700
39.1 - 40.0	11700										14400	13800	13200	12700	12200	11700	11300	10900	10600	10200	9900	9600	9500
40.1 - 45.0	10400								14100	13400	12800	12300	11700	11300	10800	10400	10100	9700	9400	9100	8800	8500	8400
45.1 - 50.0	9400						14100	13400	12700	12100	11500	11000	10600	10100	9700	9400	9000	8700	8400	8200	7900	7700	7600
50.1 - 55.0	9000			14400	14400	13600	12800	12100	11500	11000	10500	10000	9600	9200	9000	9000	9000	7900	7700	7400	7200	7000	
55.1 - 60.0	8600	14100	14100	13200	13200	12400	11700	11100	10600	10100	9600	9200	9000	9000	8900	8600	8300	7300	7000	6800	6600	6400	
60.1 - 65.0	7900	13000	13000	11200	11200	11200	10800	10300	9700	9300	9000	9000	8900	8500	8200	7900	7600						
65.1 - 70.0	7300	12100	12100	11200	11200	11000	10100	9500	9000	9000	8900	8600	8200	7900	7600	7300	7000						
70.1 - 75.0	6800	11300	11300	10600	10600	11000	9400	9000	9000	8700	8300	7900	7600	7300									
75.1 - 80.0	6300	10600	10600	9900	9900	11000	9000	8900	8500	8100	7700	7400	7100	6800									
80.1 - 85.0	5900	9900	9900	9300	9300	11000	8800	8400	8000														
85.1 - 90.0	5500	9400	9400	9000	9000	11000	8300	7900	7500														
90.1 - 95.0	5200	9000	9000	8800	8800	11000	7900	7400	7100														
95.1 - 100.0	4900	8900	8900	8300	8300	11000	7400	7000	6700														
100.1 - 105.0																							
105.1 - 110.0																							
110.1 - 115.0																							
115.1 - 120.0																							
120.1 - 125.0																							
125.1 - 130.0																							
130.1 - 135.0																							
135.1 - 140.0																							

SSAB

STRENX™
PERFORMANCE STEEL

STRENX 900 MC

General Product Description

The high-strength structural steel at 900 MPa
Strenx™ 900 MC is a hot-rolled structural steel made for cold forming, with a minimum yield strength of 900 MPa.
Strenx 900 MC meets and exceeds the requirements of S900MC in EN 10149-2. These cut-to-length sheets feature excellent thickness accuracy and surface quality in relation to strength level, providing an outstanding finish to the final products.
Typical applications include advanced lifting devices and lighter transport solutions and components.

Dimension Range
Strenx 900 MC is available as cut to length sheets with mill edge in thicknesses of 3.00- 10.00 mm, widths up to 1600 mm and lengths up to 13 meters.

Mechanical Properties

Thickness (mm)	Yield strength R_{eH} [1)] (min MPa)	Tensile strength R_m (MPa)	Elongation A_5 (min %)	Min. inner bending radius for a 90° bend[2)]
3- 8	900	930- 1200	8	3 x t
8.01- 10	900	930- 1200	8	3.5 x t

The mechanical properties are tested in the longitudinal direction.

[1)] If ReH is not applicable then Rp 0,2 is used.

[2)] For both longitudinal and transverse direction.

Impact Properties

Min. impact energy for longitudinal testing Charpy V 10x10 mm tests specimens	Test temperature
27 J	-40 °C

Impact testing according to EN 10149-2 (-20 °C /minimum 40J) is available if specified at the time of order.

Impact testing according to EN ISO 148-1 is performed on thicknesses ≥ 5mm. The specified minimum value corresponds to a full-size specimen.

SSAB

STRENX 900 MC

Chemical Composition (ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Al_{tot} (min %)	Nb[1] (max %)	V[1] (max %)	Ti[1] (max %)
0.10	0.25	1.30	0.020	0.010	0.015	0.05	0.05	0.07

The steel is grain refined.

[1] Sum of Nb, V and Ti = max 0.18%

Carbon equivalent CET(CEV)

Thickness (mm)	3 - 7.9	8 - 10
Typical CET (CEV)	0.25 (0.50)	0.27 (0.53)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees offer considerably narrower thickness tolerances compared to EN 10 051.

Length and Width
Width and length tolerances according to SSAB standard. The SSAB standard offer narrower width and length tolerances compared to EN 10 051. Length tolerances only apply for cut to length sheets.

Shape
Tolerances according to EN 10 051. Narrower tolerances according to the SSAB standard are available on request.

Flatness
Tolerances according to Strenx Flatness Guarantees Class A. Strenx Flatness Guarantees offer narrower tolerances compared to EN 10 051. Flatness guarantees only apply for cut to length sheets.

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

Delivery Conditions

Strenx 900 MC is supplied in as rolled surface condition, pickled surface is available in a limited thickness range. The product is thermomechanically rolled.

STRENX 900 MC

Fabrication and Other Recommendations

Welding, bending and machining

Strenx 900 MC has good welding, cold forming and cutting performance.

Strenx 900 MC is not suited for applications requiring hot working or heat treatments at temperatures above 400°C since the material then may lose its guaranteed properties.

For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult Tech Support, techsupport@ssab.com.

Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

2017-01-11

Product program

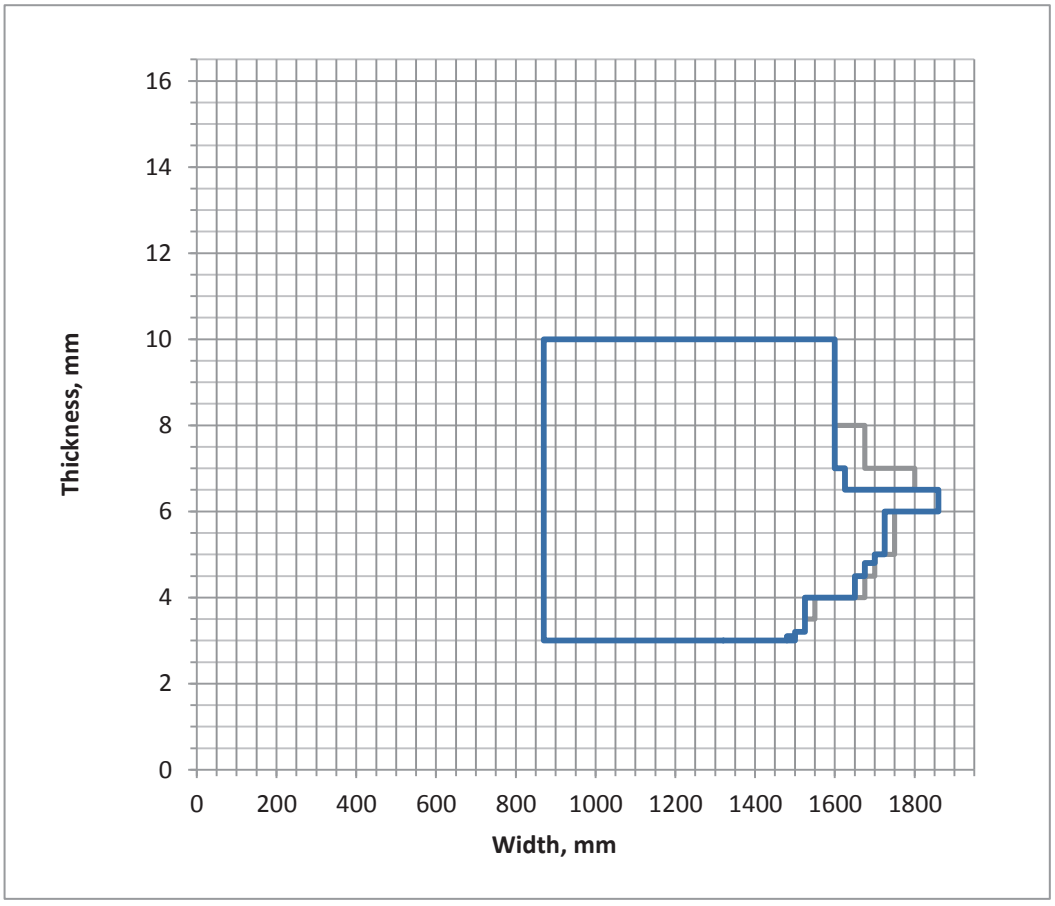
STRENX 900 MC

Hot rolled wide strip in sheets can be provided with respect to the following requirements

- Steel grade..... STRENX 900 MC
- Edge condition..... Mill edge
- Surface condition..... As rolled

Some restrictions

In dimensions according to the following diagram:



Other requirements may impose further restrictions in addition to what have been specified above.

SSAB

STRENX™
PERFORMANCE STEEL

STRENX 900 PLUS

General Product Description

The high-strength structural steel at 900 MPa
Strenx™ 900 Plus is a hot-rolled structural strip steel made for cold forming, with a minimum yield strength of 900 MPa.
Strenx 900 Plus combines good weldability with good toughness and strength in the welds. These cut-to-length sheets feature excellent thickness accuracy in the strength level, providing an outstanding finish to the final products.
Typical applications include advanced lifting devices and lighter transport solutions and components.

Dimension Range
Strenx 900 Plus is available as cut to length sheets in thicknesses of 3.00- 6.00 mm, widths up to 1600 mm and lengths up to 16 meters.

Mechanical Properties

Thickness (mm)	Yield strength R_{eH} [1)] (min MPa)	Tensile strength R_m (MPa)	Elongation A_5 (min %)	Min. inner bending radius for a 90° bend
3- 6	900	930- 1200	11	3.0 xt

The mechanical properties are tested in the longitudinal direction.
Mechanical testing in the transverse direction is available after special agreement at order.
[1)] If ReH is not applicable then Rp 0,2 is used.

Impact Properties

Min. impact energy for longitudinal testing Charpy V 10x10 mm tests specimens	Test temperature
27 J	-40 °C

Impact testing according to EN ISO 148-1 is performed on thicknesses ≥ 6mm. The specified minimum value corresponds to a full-size specimen.

SSAB

STRENX 900 PLUS

Chemical Composition (ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Al_{tot} (min %)
0.18	0.50	2.10	0.020	0.010	0.018

The steel is grain refined.

In addition Nb, V, Cr, Mo, B, Ti may be used.

Carbon equivalent CET(CEV)

Thickness (mm)	
Typical CET (CEV)	0.34 (0.50)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness

Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees offer considerably narrower thickness tolerances compared to EN 10 051.

Length and Width

Width and length tolerances according to SSAB standard. The SSAB standard offer narrower width and length tolerances compared to EN 10 051. Length tolerances only apply for cut to length sheets.

Shape

Tolerances according to EN 10 051. Narrower tolerances according to the SSAB standard are available on request.

Flatness

Tolerances according to Strenx Flatness Guarantees Class A. Strenx Flatness Guarantees offer narrower tolerances compared to EN 10 051. Flatness guarantees only apply for cut to length sheets.

Surface Properties

According to EN 10 163-2 Class A, Subclass 3.

Delivery Conditions

Strenx 900 Plus is supplied in as rolled surface condition, pickled surface is available in a limited thickness range.
The product is thermomechanically rolled and further processed for final properties.

STRENX 900 PLUS

Fabrication and Other Recommendations

Strenx 900 Plus has very good weldability with good toughness and strength in the welds.
Strenx 900 Plus has good forming and cutting performance.
Strenx 900 Plus is not suited for applications requiring hot working or heat treatments at temperatures above 400°C, since the material then may lose its guaranteed properties.
For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult Tech Support, techsupport@ssab.com.
Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

2015-11-05

Product program

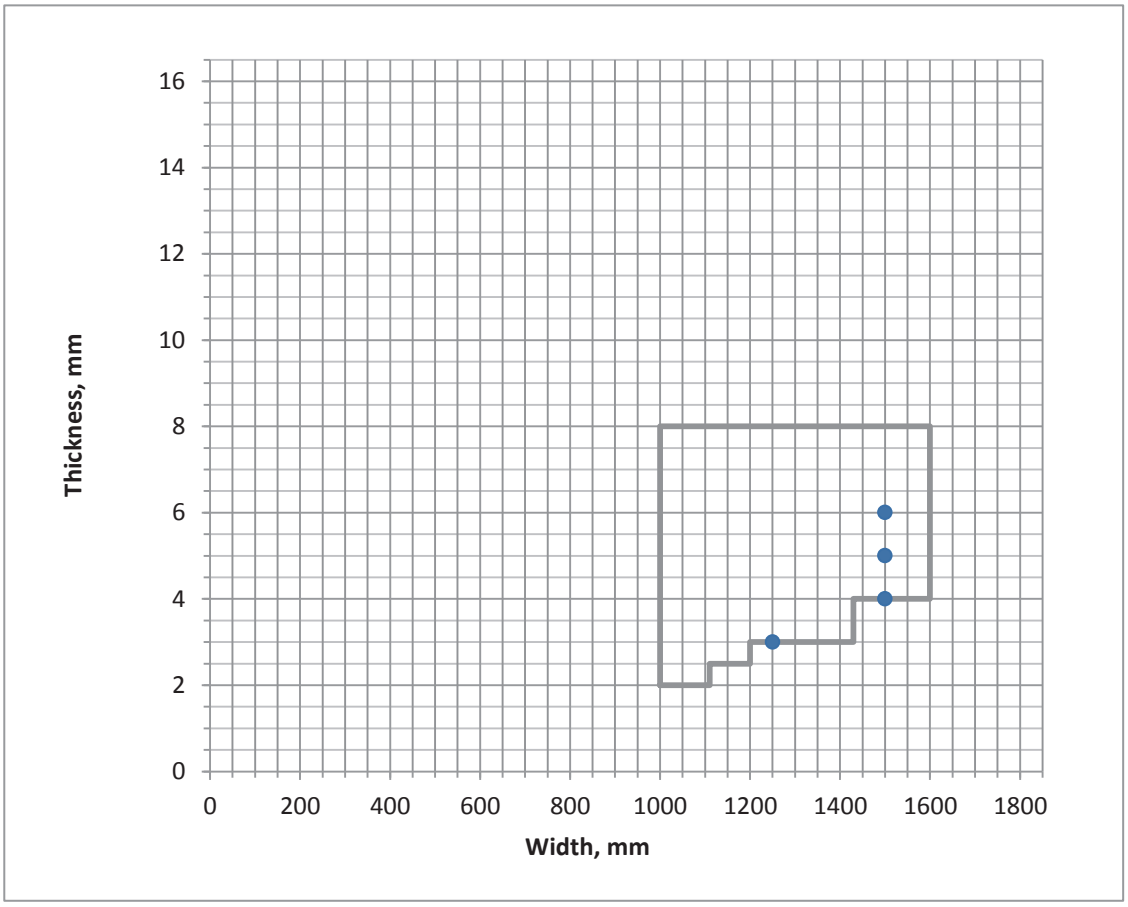
STRENX 900 Plus

Hot rolled wide strip in sheets can be provided with respect to the following requirements

- Steel grade..... STRENX 900 Plus
- Edge condition..... Mill edge
- Surface condition..... As rolled

Some restrictions

In dimensions according to the following diagram:



Other requirements may impose further restrictions in addition to what have been specified above.

SSAB

STRENX™
PERFORMANCE STEEL

STRENX 960

General Product Description

The high-strength structural steel at 960 MPa
Strenx™ 960 is a structural steel that guarantees a minimum yield strength of up to 960 MPa depending on thickness.
Strenx 960 meets the requirements of EN 10 025-6 for the S960 QL grade and thicknesses. Typical applications include demanding load-bearing structures.
Strenx 960 benefits include:

- Exceptional consistency within a plate guaranteed by close tolerances
- High impact toughness which provides for good resistance to fractures
- Superior bendability and surface quality
- Weldability with excellent HAZ strength and toughness

Dimension Range
Strenx 960 is available in plate thicknesses of 4 – 100 mm. Strenx 960 is available in widths up to 3350 mm and lengths up to 14630 mm depending on thickness. More detailed information on dimensions is provided in the dimension program

Mechanical Properties

Thickness (mm)	Yield strength $R_{p0.2}$ [1)] (min MPa)	Tensile strength[1)] R_m (MPa)	Elongation A_5 (min %)
4.0- 53.0	960	980- 1150	12
53.1- 100	850	900- 1100	10

[1)] For transverse test pieces according to EN 10 025.

Impact Properties

Grade	Min transverse test, impact energy, Charpy V 10x10 mm tests specimens[2)]	Exceeds the requirements for
Strenx 960 E	40 J/- 40 ^{0}C	S 960 QL

[2)] Unless otherwise agreed, transverse impact testing according to EN 10025-6 option 30 will apply. For thicknesses between 6- 11.9 mm, sub-size Charpy V-specimens are used. The specified minimum value is then proportrional to the cross-sectional area of the specimen compared to a full-size specimen (10 x 10 mm).

SSAB

STRENX 960

Chemical Composition (ladle analysis)

C *) (max %)	Si *) (max %)	Mn *) (max %)	P (max %)	S (max %)	Cr *) (max %)	Cu*) (max %)	Ni*) (max %)	Mo*) (max %)	B *) (max %)
0.20	0.50	1.60	0.020	0.010	0.80	0.3	2.0	0.70	0.005

The steel is grain refined. *) Intentional alloying elements.

Maximum Carbon equivalent CET(CEV)

Thickness (mm)	4.0 - 34.9 mm	35.0 - 100.0 mm
CET(CEV)	0.38 (0.58)	0.41 (0.67)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given in SSAB's brochures 41-General product information Strenx, Hardox, Armox and Toolox-UK and Strenx™ Guarantees or on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees meets the requirements of EN 10 029 Class A, but offers narrower tolerances.

Length and Width
According to SSAB's dimension program. Tolerances conform with EN 10 029.

Shape
SSAB offers tolerances according to EN 10 029

Flatness
Tolerances according to Strenx Flatness Guarantee Class C, which are more narrow than EN 10 029 Class N.

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

Bending
Tolerances according to Strenx Bending Guarantee Class B.

Delivery Conditions

The delivery condition is Q+T (Quenched and Tempered). The plates are delivered with sheared or thermally cut edges. Untrimmed edges after agreement. Delivery requirements can be found in SSAB's brochure 41-General product information Strenx, Hardox, Armox and Toolox-UK or on www.ssab.com.

STRENX 960

Fabrication and Other Recommendations

Welding, bending and machining

Recommendations are found in SSAB's brochures at www.ssab.com or consult Tech Support, techsupport@ssab.com.
Strenx 960 has obtained its mechanical properties by quenching and subsequent tempering. The properties of the delivery condition cannot be retained after exposure to temperatures in excess of 550ºC.
Appropriate health and safety precautions must be taken when welding, cutting, grinding or otherwise working on this product. Grinding, especially of primer coated plates, may produce dust with a high particle concentration.

Strenx 960

2015-06-08

The table shows available dimensions for direct order including the maximum length (mm)

Some restrictions, contact your local sales representative for more information

Only 1650 mm width, mill edges. Other dimensions must be approved by Product Manager Strenx
For thermally cut edges, contact local sales force

Outside the range of dimensions

Minimum length: 2000 mm

Minimum quantities:

Thickness:	Minimum position weight:
4.0 - 60.0	2.5 tons
60.1 - 100,0	3.5 tons

Width (mm)	1000-	-1351	1500	1501	1600	-1601	-1700	-1801	-1901	-2001	-2101	-2201	-2301	-2401	-2501	-2601	-2701	-2801	-2901	-3001	-3101	-3201	-3301
Thickness (mm)	1350	1499		1599		1699	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000	3100	3200	3300	3350
3.0 - 3.9																							
4.0 - 4.7																							
4.8 - 5.7																							
5.8 - 6.0																							
6.1 - 6.7																							
6.8 - 7.7																							
7.8 - 8.7																							
8.8 - 10.0																							
10.1 - 25.0																							
25.1 - 26.0																							14600
26.1 - 27.0																						14200	14000
27.1 - 28.0																					14200	13700	13500
28.1 - 29.0																				14100	13700	13300	13100
29.1 - 30.0																			14100	13600	13200	12800	12600
30.1 - 31.0																		14100	13600	13200	12800	12400	12200
31.1 - 32.0						Maximum length 14630 mm											14200	13700	13200	12800	12400	12000	11800
32.1 33.0	14200															14200	13700	13300	12800	12400	12000	11600	11500
33.1 - 34.0	13800														14400	13800	13300	12900	12400	12000	11700	11300	11100
34.1 - 35.0	13400													14500	13900	13400	12900	12500	12100	11700	11300	11000	10800
35.1 - 36.0	13100													14100	13600	13100	12600	12200	11700	11400	11000	10700	10500
36.1 - 37.0	12700												14300	13700	13200	12700	12200	11800	11400	11100	10700	10400	10200
37.1 - 38.0	12400											14500	13900	13400	12800	12400	11900	11500	11100	10800	10400	10100	10000
38.1 - 39.0	12000											14200	13600	13000	12500	12000	11600	11200	10800	10500	10200	9800	9700
39.1 - 40.0	11700										14400	13800	13200	12700	12200	11700	11300	10900	10600	10200	9900	9600	9500
40.1 - 45.0	10400								14100	13400	12800	12300	11700	11300	10800	10400	10100	9700	9400	9100	8800	8500	8400
45.1 - 50.0	9400						14100	13400	12700	12100	11500	11000	10600	10100	9700	9400	9000	8700	8400	8200	7900	7700	7600
50.1 - 55.0	9000			14400	14400	13600	12800	12100	11500	11000	10500	10000	9600	9200	9000	9000	9000	7900	7700	7400	7200	7000	
55.1 - 60.0	8600	14100	14100	13200	13200	12400	11700	11100	10600	10100	9600	9200	9000	9000	8900	8600	8300	7300	7000	6800	6600	6400	
60.1 - 65.0	7900	13000	13000	11200	11200	11200	10800	10300	9700	9300	9000	9000	8900	8500	8200	7900	7600						
65.1 - 70.0	7300	12100	12100	11200	11200	11000	10100	9500	9000	9000	8900	8600	8200	7900	7600	7300	7000						
70.1 - 75.0	6800	11300	11300	10600	10600	11000	9400	9000	9000	8700	8300	7900	7600	7300									
75.1 - 80.0	6300	10600	10600	9900	9900	11000	9000	8900	8500	8100	7700	7400	7100	6800									
80.1 - 85.0	5900	9900	9900	9300	9300	11000	8800	8400	8000														
85.1 - 90.0	5500	9400	9400	9000	9000	11000	8300	7900	7500														
90.1 - 95.0	5200	9000	9000	8800	8800	11000	7900	7400	7100														
95.1 - 100.0	4900	8900	8900	8300	8300	11000	7400	7000	6700														
100.1 - 105.0																							
105.1 - 110.0																							
110.1 - 115.0																							
115.1 - 120.0																							
120.1 - 125.0																							
125.1 - 130.0																							
130.1 - 135.0																							
135.1 - 140.0																							

SSAB

STRENX™
PERFORMANCE STEEL

STRENX 960 MC

General Product Description

The high-strength structural steel at 960 MPa
Strenx™ 960 MC is a hot-rolled structural steel made for cold forming, with a minimum yield strength of 960 MPa.
Strenx 960 MC meets and exceeds the requirements of S960MC in EN 10149-2. These cut-to-length sheets feature excellent thickness accuracy and surface quality in relation to strength level, providing an outstanding finish to the final products.
Typical applications include advanced lifting devices such as mobile cranes and lighter transport solutions and components.

Dimension Range
Strenx 960 MC is available as cut to length with mill edge in thicknesses of 3.00- 10.00 mm, widths up to 1600 mm and lengths up to 13 meters.

Mechanical Properties

Thickness (mm)	Yield strength R_{eH} [1)] (min MPa)	Tensile strength R_m (MPa)	Elongation A_5 (min %)	Min. inner bending radius for a 90° bend[2)]
3- 10	960	980- 1250	7	3.5 xt

The mechanical properties are tested in the longitudinal direction.

[1)] If ReH is not applicable then Rp 0,2 is used.

[2)] For both longitudinal and transverse direction.

Impact Properties

Min. impact energy for longitudinal testing Charpy V 10x10 mm tests specimens	Test temperature
27 J	-40 °C

Impact testing according to EN 10149-2 (-20 °C /minimum 40J) is available if specified at the time of order.

Impact testing according to EN ISO 148-1 is performed on thicknesses ≥ 5mm. The specified minimum value corresponds to a full-size specimen.

SSAB

STRENX 960 MC

Chemical Composition (ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Al_{tot} (min %)	Nb [1] (max %)	V [1] (max %)	Ti [1] (max %)
0.12	0.25	1.30	0.020	0.010	0.015	0.05	0.05	0.07

The steel is grain refined.

[1] Sum of Nb, V and Ti = max 0.18%

Carbon equivalent CET(CEV)

Thickness (mm)	3 - 7.99 mm	8 - 10 mm
Typical CET (CEV)	0.28 (0.51)	0.30 (0.57)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees offer considerably narrower thickness tolerances compared to EN 10 051.

Length and Width
Width and length tolerances according to SSAB standard. The SSAB standard offer narrower width and length tolerances compared to EN 10 051. Length tolerances only apply for cut to length sheets.

Shape
Tolerances according to EN 10 051. Narrower tolerances according to the SSAB standard are available on request.

Flatness
Tolerances according to Strenx Flatness Guarantees Class A. Strenx Flatness Guarantees offer narrower tolerances compared to EN 10 051. Flatness guarantees only apply for cut to length sheets.

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

Delivery Conditions

Strenx 960 MC is supplied in as rolled surface condition, pickled surface is available in a limited thickness range. The product is thermomechanically rolled.

STRENX 960 MC

Fabrication and Other Recommendations

Strenx 960 MC has good welding, cold forming and cutting performance.
Strenx 960 MC is not suited for applications requiring hot working or heat treatments at temperatures above 400°C since the material then may lose its guaranteed properties.
For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult Tech Support, techsupport@ssab.com. Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

2017-01-11

Product program

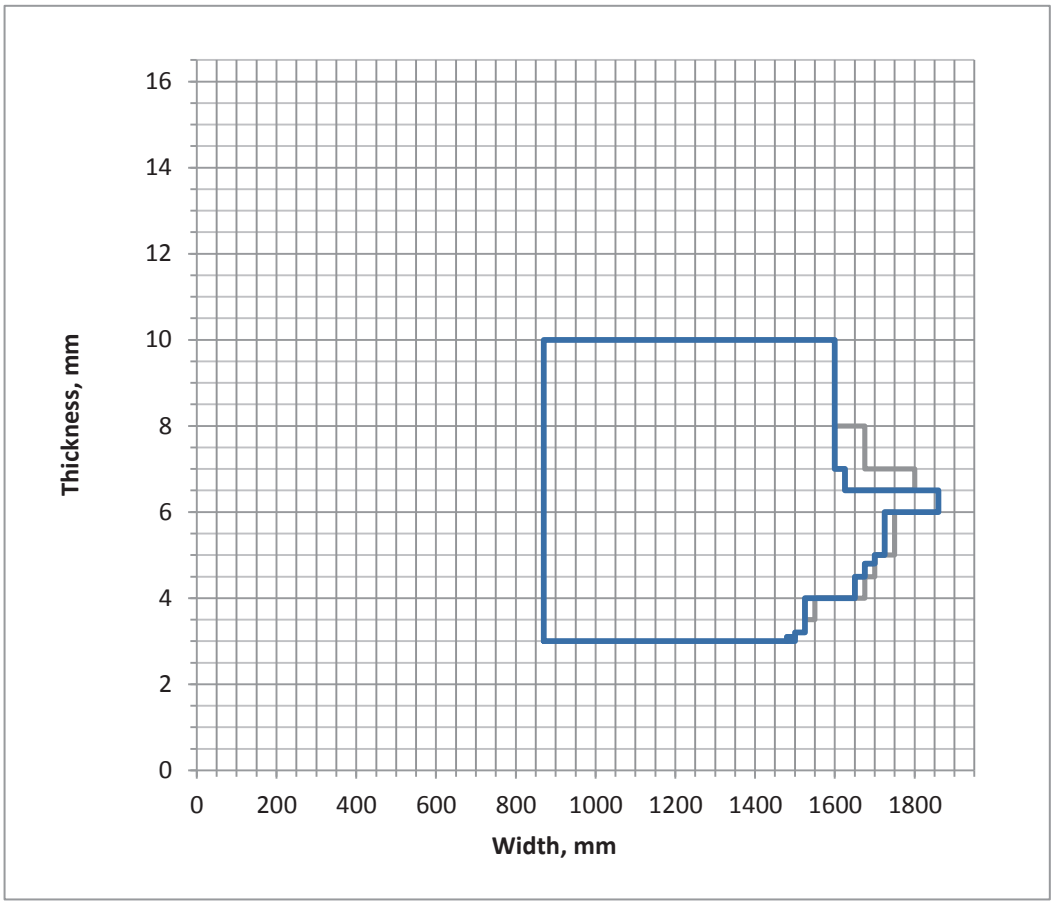
STRENX 960 MC

Hot rolled wide strip in sheets can be provided with respect to the following requirements

- Steel grade..... STRENX 960 MC
- Edge condition..... Mill edge
- Surface condition..... As rolled

Some restrictions

In dimensions according to the following diagram:



Other requirements may impose further restrictions in addition to what have been specified above.

SSAB

STRENX™
PERFORMANCE STEEL

STRENX 960 PLUS

General Product Description

The high-strength structural steel at 960 MPa
Strenx™ 960 Plus is a hot-rolled structural strip steel made for cold forming, with a minimum yield strength of 960 MPa. Strenx 960 Plus combines good weldability with good toughness and strength in the welds. These cut-to-length sheets feature excellent thickness accuracy in the strength level, providing an outstanding finish to the final products.
Typical applications include advanced lifting devices and lighter transport solutions and components.

Dimension Range
Strenx 960 Plus is available as cut to length sheets in thicknesses of 3.00- 6.00 mm, widths up to 1600 mm and lengths up to 16 meters.

Mechanical Properties

Yield strength R_{eH} [1)] (min MPa)	Tensile strength R_m (MPa)	Elongation A_5 (min %)	Min. inner bending radius for a 90° bend[2)]
960	980- 1250	10	3.5xt

The mechanical properties are tested in the longitudinal direction.

Mechanical testing in the transverse direction is available after special agreement at order.

[1)] If ReH is not applicable then Rp0,2 is used.

[2)] For both longitudinal and transverse direction.

Impact Properties

Min. Impact energy for longitudinal test Charpy V 10x10 mm test specimens	Test temperature
27 J	-40 °C

Impact testing according to EN ISO 148-1 is performed on thicknesses ≥ 6mm. The specified minimum value corresponds to a full-size specimen.

SSAB

STRENX 960 PLUS

Chemical Composition (ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Al_{tot} (min %)
0.18	0.50	2.10	0.020	0.010	0.018

The steel is grain refined.

In addition Nb, V, Cr, Mo, B, Ti may be used.

Carbon equivalent CET(CEV)

Thickness (mm)	3 - 6
Typical CET (CEV)	0.34 (0.50)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness

Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees offer considerably narrower thickness tolerances compared to EN 10 051.

Length and Width

Width and length tolerances according to SSAB standard. The SSAB standard offer narrower width and length tolerances compared to EN 10 051. Length tolerances only apply for cut to length sheets.

Shape

Tolerances according to EN 10 051. Narrower tolerances according to the SSAB standard are available on request.

Flatness

Tolerances according to Strenx Flatness Guarantees Class A. Strenx Flatness Guarantees offer narrower tolerances compared to EN 10 051. Flatness guarantees only apply for cut to length sheets.

Surface Properties

According to EN 10 163-2 Class A, Subclass 3.

Delivery Conditions

Strenx 960 Plus is supplied in as rolled surface condition, pickled surface is available in a limited thickness range.
The product is thermomechanically rolled and further processed for final properties.

STRENX 960 PLUS

Fabrication and Other Recommendations

Strenx 960 Plus has very good weldability with good toughness and strength in the welds.
Strenx 960 Plus has good forming and cutting performance.
Strenx 960 Plus is not suited for applications requiring hot working or heat treatments at temperatures above 400°C, since the material then may lose its guaranteed properties.
For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult Tech Support, techsupport@ssab.com.
Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

2015-11-05

Product program

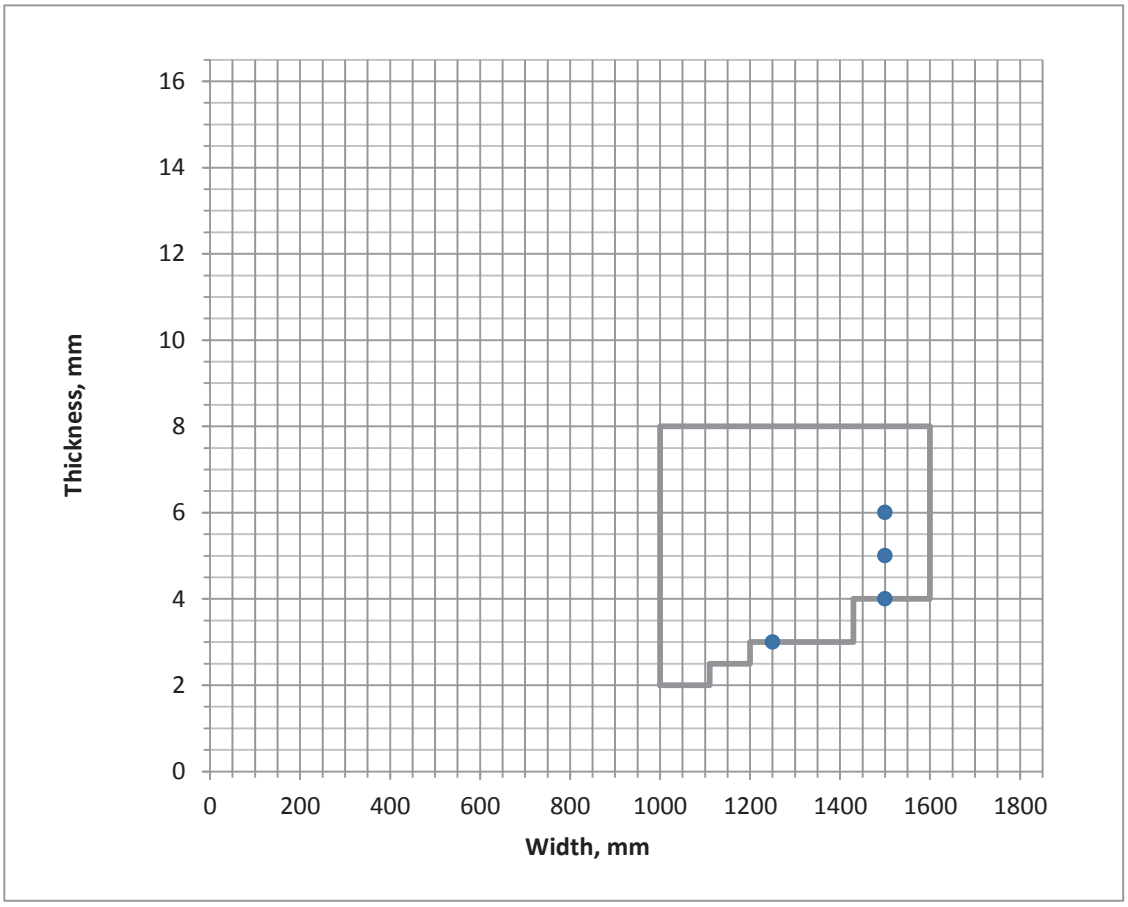
STRENX 960 Plus

Hot rolled wide strip in sheets can be provided with respect to the following requirements

- Steel grade..... STRENX 960 Plus
- Edge condition..... Mill edge
- Surface condition..... As rolled

Some restrictions

In dimensions according to the following diagram:



Other requirements may impose further restrictions in addition to what have been specified above.

SSAB

STRENX™
PERFORMANCE STEEL

STRENX 960 CR

General Product Description

The high-strength structural steel at 960 MPa
Strenx™ 960 CR is a cold-rolled structural steel with a minimum yield strength of 960 MPa used to produce stronger and lighter structures.
Typical applications include a wide range of components and parts, for example load-bearing structures. Strenx 960 CR comes in cut-to-length sheets.

Dimension Range
Strenx 960 CR is available as cut to length sheets in thicknesses of 0.70-2.10 mm, widths up to 1500 mm and in lengths up to 8.5 meters.

Mechanical Properties

Yield strength $R_{p0.2}$ (min MPa)	Tensile strength R_m (MPa)	Elongation A_{80} (min %)	Min. inner bending radius for a 90° bend[1)]
960	1200- 1400	3	3.5 x t

The mechanical properties are tested in the longitudinal direction.

The mechanical properties are guaranteed in coil condition.

[1)] For both longitudinal and transverse direction.

Chemical Composition (ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Al (min %)	Nb+Ti (max %)
0.14	0.40	2.00	0.020	0.010	0.015	0.10

Carbon equivalent CET(CEV)

Thickness (mm)	0.70 - 2.10
Typical CET (CEV)	0.28 (0.39)

SSAB

STRENX 960 CR

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Thickness guarantees meet the normal thickness tolerance requirements of EN 10131.

Length and Width
Tolerances according to EN 10131. Narrower tolerances according to the SSAB standard are available on request. Length tolerances only apply for cut to length sheets.

Delivery Conditions

Cold rolled. Strenx 960 CR is available with mill or cut edge.

Fabrication and Other Recommendations

Welding, bending and machining
Strenx 960 CR has good cold forming, welding and cutting performance.
For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult Tech Support, techsupport@ssab.com.
Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

STRENX™
PERFORMANCE STEEL

STRENX 1100

General Product Description

The high-strength structural steel at 1100 MPa
Strenx™ 1100 is a structural steel with a high yield strength at a minimum of 1100 MPa. Typical applications include demanding load-bearing structures.
Despite its strength, the material is surprisingly easy to weld and bend. Strenx 1100 benefits include:

- Good weldability with excellent HAZ strength and toughness
- Exceptional consistency within a plate guaranteed by close tolerances
- High impact toughness which provides for good resistance to fractures
- Superior bendability and surface quality

Dimension Range
Strenx 1100 is available in plate thicknesses of 4 – 40 mm. Strenx 1100 is available in widths up to 3200 mm and lengths up to 14630 mm depending on thickness. More detailed information on dimensions is provided in the dimension program

Mechanical Properties

Thickness (mm)	Yield strength [1] $R_{p0.2}$ (min MPa)	Tensile strength [1] R_m (MPa)	Elongation A_5 (min %)
4.0- 4.9	1100	1250- 1550	8
5.0- 40.0	1100	1250- 1550	10

[1] For transverse test pieces according to EN 10 025.

Impact Properties

Grade	Min transverse test, impact energy, Charpy V 10x10 mm tests specimens[2]
Strenx 1100 E	27 J/- 40 °C
Strenx 1100 F	27 J/- 60 °C

[2] Unless otherwise agreed, transverse impact testing according to EN 10 025-6 option 30 will apply. For thicknesses between 6 - 11.9 mm, subsize Charpy V-specimens are used. The specified minimum value is then proportional to the cross-sectional area of the specimen compared to a full-size specimen (10 x 10 mm).

SSAB

STRENX 1100

Chemical Composition (ladle analysis)

C *) (max %)	Si *) (max %)	Mn *) (max %)	P (max %)	S (max %)	Cr *) (max %)	Cu (max %)	Ni *) (max %)	Mo *) (max %)	B *) (max %)
0.21	0.50	1.40	0.020	0.005	0.80	0.30	3	0.70	0.005

The steel is grain-refined. *) Intentional alloying elements.

Maximum Carbon equivalent CET(CEV)

Thickness (mm)	4.0 - 4.9	5.0 - 7.9	8.0 - 14.9	15.0 - 40.0
1100 E CET(CEV)	0.37 (0.57)	0.38 (0.58)	0.39 (0.62)	0.42 (0.73)
1100 F CET(CEV)	-	0.40 (0.70)	0.40 (0.70)	0.42 (0.73)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given in SSAB's brochures 41-General product information Strenx, Hardox, Armox and Toolox-UK and Strenx™ Guarantees or on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees meets the requirements of EN 10 029 Class A, but offers narrower tolerances.

Length and Width
According to SSAB's dimension program. Tolerances conform to EN 10 029.

Shape
SSAB offers tolerances according to EN 10 029.

Flatness
Tolerances according to Strenx Flatness Guarantees Class D, which are narrower than EN 10 029 Class N.

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

Bending
Tolerances according to Strenx Bending Guarantee Class C.

Delivery Conditions

The delivery condition is Q or QT (Quenched or Quenched and Tempered at our discretion). The plates are delivered with sheared or thermally cut edges. Untrimmed edge after agreement. Delivery requirements can be found in SSAB's brochure 41-General product information Strenx, Hardox, Armox and Toolox-UK or on www.ssab.com.

STRENX 1100

Fabrication and Other Recommendations

Welding, bending and machining

Recommendations are found in SSAB's brochures on www.ssab.com or consult Tech Support, techsupport@ssab.com.
Strenx 1100 has obtained its mechanical properties by quenching and subsequent tempering. The properties of the delivery condition cannot be retained after exposure to temperatures in excess of 200ºC.
Appropriate health and safety precautions must be taken when welding, cutting, grinding or otherwise working on this product. Grinding, especially of primer coated plates, may produce dust with a high particle concentration.

Strenx 1100 2015-12-03

The table shows available dimensions for direct order including the maximum length (mm)

Some restrictions, contact your local sales representative for more information

Outside the range of dimensions

Minimum length: 2000 mm
Minimum quantities:

Thickness:	Minimum position weight:
4.0-40.0	2.5 tons

Width (mm)	1000-	-1351	1500	1501	1600	-1601	-1700	-1801	-1901	-2001	-2101	-2201	-2301	-2401	-2501	-2601	-2701	-2801	-2901	-3001	-3101	-3201	-3301
Thickness (mm)	1350	1499		1599		1699	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000	3100	3200	3300	3350
3.0 - 3.9																							
4.0 - 4.7																							
4.8 - 5.7																							
5.8 - 6.0																							
6.1 - 6.7																							
6.8 - 7.7																							
7.8 - 8.7																							
8.8 - 10,0																							
10.1 - 25.0																							
25.1 - 26.0																							
26.1 - 27.0																							
27.1 - 28.0																							
28.1 - 29.0																							
29.1 - 30.0																							
30.1 - 31,0																							
31.1 - 32.0						Maximum length 14630 mm																	
32.1 - 33.0	14200																						
33.1 - 34.0	13800																						
34.1 - 35.0	13400													14500									
35.1 - 36.0	13100													14100									
36.1 - 37.0	12700												14300	13700									
37.1 - 38.0	12400											14500	13900	13400									
38.1 - 39.0	12000											14200	13600	13000									
39.1 - 40.0	11700										14400	13800	13200	12700									
40.1 - 45.0																							
45.1 - 50.0																							
50.1 - 55.0																							
55.1 - 60.0																							
60.1 - 65.0																							
65.1 - 70.0																							
70.1 - 75.0																							
75.1 - 80.0																							

STRENX™
PERFORMANCE STEEL

STRENX 1100 MC

General Product Description

The high-strength structural steel at 1100 MPa
Strenx™ 1100 MC is a hot-rolled structural steel made for cold forming, with a minimum yield strength of 1100 MPa for stronger and lighter structures.
These cut-to-length sheets feature excellent thickness accuracy and surface quality in relation to strength level, providing an outstanding finish to the final products.
Typical applications include a wide range of parts and components such as demanding load-bearing structures.

Dimension Range
Strenx 1100 MC is available as cut to length sheets in thicknesses of 3.00 to 8.00 mm, widths up to 1700mm and lengths up to 16 meters.

Mechanical Properties

Thickness (mm)	Yield strength R_{eH} [1)] (min MPa)	Tensile strength R_m (MPa)	Elongation A_5 (min %)	Min. inner bending radius for a 90° bend[2)]
3- 8	1100	1250- 1450	7	4.0 x t

The mechanical properties are tested in the longitudinal direction.

[1)] If R_{eH} is not applicable then $Rp_{0,2}$ is used.

[2)] For both longitudinal and transverse direction.

Impact Properties

Minimum energy for test on longitudinal and transverse Charpy V 10x10 mm test specimens	Test temperature
27 J	-40 °C

Impact testing according to EN ISO 148-1 is performed on thicknesses ≥ 6mm.

The specified minimum value corresponds to a full-size specimen.

SSAB

STRENX 1100 MC

Chemical Composition (ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Al (min %)
0.15	0.5	1.8	0.020	0.005	0.015

The steel is grain refined.

In addition Nb, V, Cr, Mo, B and Ti may be used.

Carbon equivalent CET(CEV)

Thickness (mm)	3 - 8 mm
Typical CET (CEV)	0.33 (0.56)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness

Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees offer considerably narrower thickness tolerances compared to EN 10 051.

Length and Width

Width and length tolerances according to SSAB standard. The SSAB standard offer narrower width and length tolerances compared to EN 10 051.

Shape

Tolerances according to EN 10 051. Narrower tolerances according to the SSAB standard are available on request.

Flatness

Tolerances according to Strenx Flatness Guarantees Class A. Strenx Flatness Guarantees offer narrower tolerances compared to EN 10 051. Flatness guarantees only apply for cut to length sheets.

Surface Properties

According to EN 10 163-2 Class A, Subclass 3.

Delivery Conditions

Thermomechanically Rolled. Strenx 1100 MC is available in as rolled surface condition.

STRENX 1100 MC

Fabrication and Other Recommendations

Strenx 1100 MC has good welding, cold forming and cutting performance.
Strenx 1100 MC is not suited for applications requiring hot working or heat treatments at temperatures above 200°C since the material then may lose its guaranteed properties.
For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult Tech Support,techsupport@ssab.com.
Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

2016-03-31

Product program

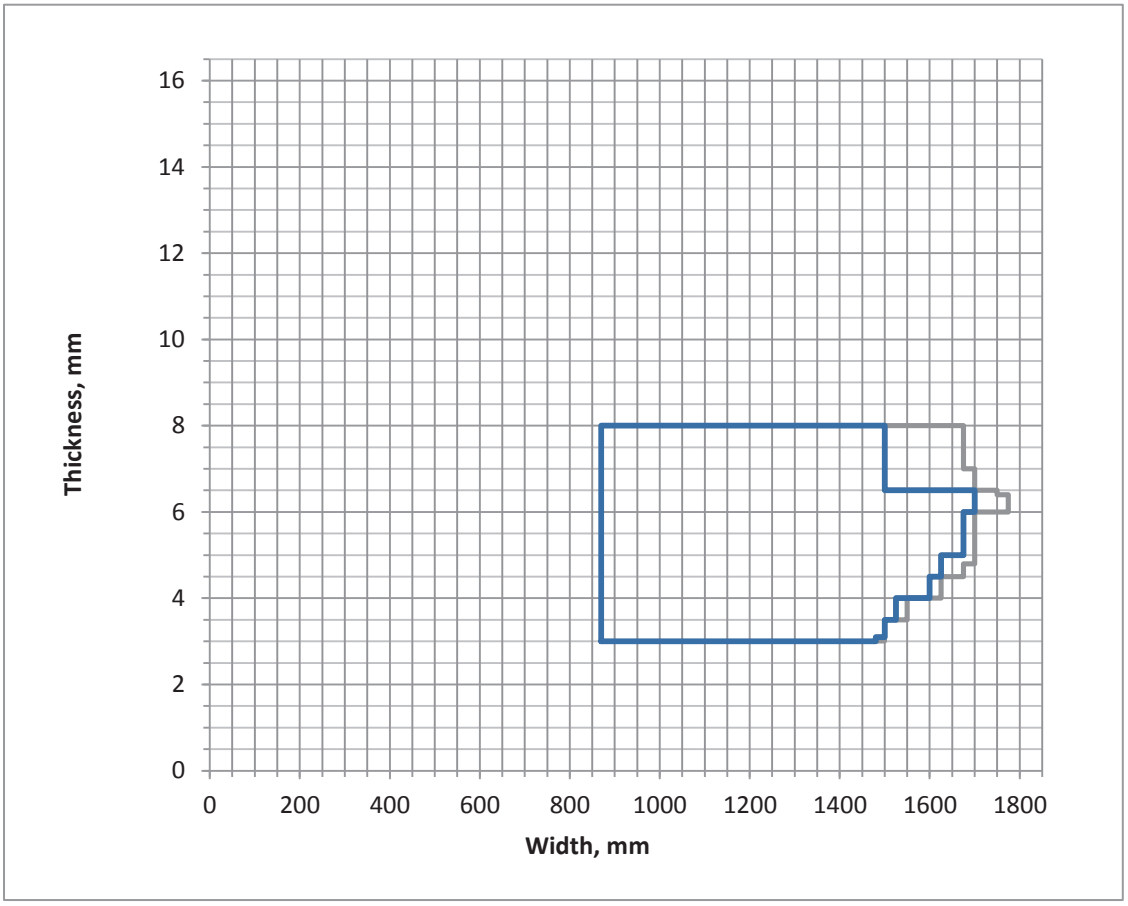
STRENX 1100 MC

Hot rolled wide strip in sheets can be provided with respect to the following requirements

- Steel grade..... STRENX 1100 MC
- Edge condition..... Mill edge
- Surface condition..... As rolled

Some restrictions

In dimensions according to the following diagram:



Other requirements may impose further restrictions in addition to what have been specified above.

SSAB

STRENX™
PERFORMANCE STEEL

STRENX 1100 CR

General Product Description

Cold-rolled structural steel at 1100 MPa
Strenx™ 1100 CR is a cold-rolled structural steel with a minimum yield strength of 1100 MPa for stronger and lighter structures. Typical applications include a wide range of components and parts in the lightest possible load-bearing structures, for example in the lifting sector.
Strenx 1100 CR is available as cut-to-length sheets.

Dimension Range

Strenx 1100 CR is available as cut to length sheets in thicknesses of 0.70-2.10 mm, widths up to 1500 mm and in lengths up to 8.5 meters.

Mechanical Properties

Yield strength $R_{p0.2}$ (min MPa)	Tensile strength R_m (MPa)	Elongation A_{80} (min %)	Min. inner bending radius for a 90° bend[1)]
1100	1300- 1500	3	3.5 x t

The mechanical properties are tested in the longitudinal direction.

The mechanical properties are guaranteed in coil condition.

[1)] Bending properties for both longitudinal and transverse direction.

Chemical Composition (ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	Al (min %)	Nb+Ti (max %)
0.16	0.40	1.80	0.020	0.010	0.015	0.10

Carbon equivalent CET(CEV)

Thickness (mm)	0.7 - 2.1
Typical CET (CEV)	0.30 (0.41)

SSAB

STRENX 1100 CR

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Thickness guarantees meet the normal thickness tolerance requirements of EN 10131.

Length and Width
Tolerances according to EN 10131. Narrower tolerances according to the SSAB standard are available on request. Length tolerances only apply for cut to length sheets.

Delivery Conditions

Cold rolled. Strenx 1100 CR is available with mill or cut edge.

Fabrication and Other Recommendations

Welding, bending and machining
Strenx 1100 CR has good cold forming, welding and cutting performance.
For information concerning fabrication, see SSAB´s brochures on www.ssab.com or consult Tech Support, techsupport@ssab.com.
Appropriate health and safety precautions must be taken when bending, welding, cutting, grinding or otherwise working on the product.

STRENX™
PERFORMANCE STEEL

STRENX 1300

General Product Description

The ultra-high-strength steel at 1300 MPa
Strenx™ 1300 is an ultra-high-strength structural steel with a minimum yield strength of 1300 MPa.
Typical applications include load-carrying structures that place very high demands on low weight. SSAB developed Strenx 1300 for building the lightest possible steel solutions or providing an alternative to other materials.
Strenx 1300 benefits include:

- Good weldability with excellent HAZ strength and toughness
- Exceptional consistency within a plate guaranteed by close tolerances
- High impact toughness which provides for good resistance to fractures
- Superior bendability and surface quality

Dimension Range
Strenx 1300 is available in plate thicknesses of 4 – 10 mm. Strenx 1300 is available in widths up to 2900 mm and lengths up to 14630 mm depending on thickness. More detailed information on dimensions is provided in the dimension program

Mechanical Properties

Thickness (mm)	Yield strength $R_{p0.2}$ [1)] (min MPa)	Tensile strength R_m [1)] (min MPa)	Elongation A_5 (min %)
4.0- 10.0	1300	1400- 1700	8

[1)] For transverse test pieces according to EN 10 025.

Impact Properties

Grade	Min transverse test, impact energy, Charpy V 10x10 mm tests specimens[2)]
Strenx 1300 E	27 J/- 40 ^{0}C
Strenx 1300 F	27 J/- 60 ^{0}C

[2)] Unless otherwise agreed, transverse impact testing according to EN 10025-6 option 30 will apply. For thicknesses between 6 - 11.9 mm, sub-size Charpy V-specimens are used. The specified min value is then proportrional to the cross-sectional area of the specimen compared to a full-size specimen (10 x 10 mm).

SSAB

STRENX 1300

Chemical Composition (ladle analysis)

C *) (max %)	Si *) (max %)	Mn *) (max %)	P (max %)	S (max %)	Cr *) (max %)	Cu (max %)	Ni*) (max %)	Mo*) (max %)	B *) (max %)
0.25	0.50	1.40	0.020	0.005	0.80	0.30	3.0	0.70	0.005

The steel is grain refined. *) Intentional alloying elements.

Maximum Carbon equivalent CET(CEV)

Thickness (mm)	4.0 - 10.0 mm
1300 E CET(CEV)	0.43 (0.67)
1300 F CET(CEV)	0.43 (0.67)

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40} \qquad CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

Tolerances

More details are given in SSAB's brochures 41-General product information Strenx, Hardox, Armox and Toolox-UK and Strenx™ Guarantees or on www.ssab.com.

Thickness
Tolerances according to Strenx Thickness Guarantees. Strenx Guarantees meet the requirements of EN 10 029 Class A, but offers narrower tolerances.

Length and Width
According to SSAB's dimension program. Tolerances conforms with EN 10 029.

Shape
SSAB offers tolerances according to EN 10 029.

Flatness
Tolerances according to Strenx Flatness Guarantee Class D, which are narrower than EN 10 029 Class N.

Surface Properties
According to EN 10 163-2 Class A, Subclass 3.

Bending
Tolerances according to Strenx Bending Guarantee Class D.

Delivery Conditions

The delivery condition is Q or QT (Quenched or Quenched and Tempered at our discretion). The plates are delivered with sheared or thermally cut edges. Untrimmed edges after agreement. Delivery requirements can be found in SSAB's brochure 41-General product information Strenx, Hardox, Armox and Toolox-UK or on www.ssab.com.

STRENX 1300

Fabrication and Other Recommendations

Welding, bending and machining

Recommendations are found in SSAB's brochures on www.ssab.com or consult Tech Support, techsupport@ssab.com.
Strenx 1300 has obtained its mechanical properties by quenching, and at our discretion, subsequent tempering. The properties of the delivery condition cannot be retained after exposure to temperatures in excess of 200ºC.
Appropriate health and safety precautions must be taken when welding, cutting, grinding or otherwise working on this product. Grinding, especially of primer coated plates, may produce dust with a high particle concentration.

Strenx 1300

2015-06-08

Minimum length: 2000 mm

Minimum quantities:

Thickness:	Minimum position weight:
3.0-60.0	2.5 tons
60.1-100,0	3.5 tons
100.1-120.0	4.0 tons
120.1-	5.0 tons

The table shows available dimensions for direct order including the maximum length (mm)

Some restrictions, contact your local sales representative for more information

Outside the range of dimensions

Width [mm]	1000 -	1351 -	1501 -	1601 -	1701 -	1801 -	1901 -	2001 -	2101 -	2201 -	2301 -	2401 -	2501 -	2601 -	2701 -	2801 -	2901 -	3001 -	3101 -	3201 -	3301 -
Thickness [mm]	1350	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000	3100	3200	3300	3350
4.0 - 4.7	14630	14630	14630	14630																	
4.8 - 5.7	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630									
5.8 - 6.7	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630							
6.8 - 7.7	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630					
7.8 - 8.7	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630					
8.8 - 10.0	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630	14630					
10.1 - 15.0																					
15.1 - 20.0																					
20.1 - 25.0																					
25.1 - 30.0																					
30.1 - 35.0																					
35.1 - 40.0																					
40.1 - 45.0																					
45.1 - 50.0																					
50.1 - 55.0																					
55.1 - 60.0																					
60.1 - 65.0																					
65.1 - 70.0																					
70.1 - 75.0																					
75.1 - 80.0																					
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115.1 - 120.0																					
120.1 - 125.0																					
125.1 - 130.0																					
130.1 - 135.0																					
135.1 - 140.0																					