

TOOLOX[®] GUARANTEES



SSAB

TOOLOX[®] GUARANTEES

SSAB continuously improves its production processes in order to develop new and better products. As a result, you get both closer tolerances and improved workshop properties.

Toolox[®] guarantees include close thickness tolerances as well as close flatness tolerances. These product guarantees have been made in order to further enhance the promise of outstanding workshop performance.

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TOOLOX® PLATE DIMENSION GUARANTEE

Toolox® thickness guarantee

The thickness tolerances according to SSAB's Thickness guarantee are closer than those specified in EN 10 029 except for ≥ 80 mm, for which the tolerance range is according to standard.

Ordered plate thickness (mm)	Thickness tolerance (mm)		Max deviation within one single plate (mm)
	Min	Max	
6.0 – 7.9	0	+ 0.8	0.6
8.0 – 14.9	0	+ 1.0	0.7
15.0 – 24.9	0	+ 1.2	0.8
25.0 – 35.0	0	+ 1.5	1.0
35.1 – 80.0	0	+ 2.4	1.1
80.1 – 130.0	0	+ 2.4	1.2
130.1 – 165.0	0	+ 3.2	-

Toolox® length and width guarantee

Toolox® standard delivery format is with unformatted edges and with extended width tolerance and extended length tolerance.

Ordered plate length (mm)	Length tolerance (mm)	
	Min	Max
0 – 3999	0	+ 200
4000 – 5999	0	+ 300
6000 – 7999	0	+ 400
8000 – 9999	0	+ 500
10000 – 12000	0	+ 750

Ordered plate width (mm)	Width tolerance (mm)	
	Min	Max
1650 – 2050	0	+ 70
2050 –	According to EN 10 029 standard.	

Toolox® flatness guarantee

The measurement conforms with manual procedure according to EN 10 029.

Ordered plate thickness (mm)	Tolerance 1000 mm ruler	Tolerance 2000 mm ruler
6.0 – 7.9	4 mm	8 mm
8.0 – 104.0	3 mm	6 mm
104.1 – 165.0	5 mm	8 mm

TOOLOX® ROUND BAR DIMENSION GUARANTEE

Toolox® length tolerances

Length tolerance according to EN 10 060, with tolerance -0/+200 mm.

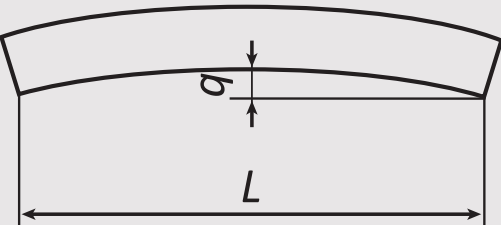
Toolox® diameter tolerance

According to EN 10 060 Limit deviation precision for turned surface with $\varnothing \leq 75$ mm. SSAB specification for turned surface with $\varnothing \geq 75 - 172$ mm.

Dimension \varnothing (mm)	Tolerances, Turned surfaces (mm)	
	Min	Max
20-23	0	+ 0.4
24-31	0	+ 0.5
32-41	0	+ 0.6
42-54	0	+ 0.8
55-75	0	+ 1.0
76-125	0	+ 1.0
126-172	0	+ 2.0

Toolox® straightness guarantee

Tolerances according to EN 10 060. However, the bars generally contain a max deviation of 0.2% of length, meaning 2 mm/m.

Straightness, q	
	
Normal \varnothing	Tolerances
$q < d \leq 25$	Not fixed
$25 < d \leq 80$	$q \leq 0.4\%$ of L
$80 < d \leq 250$	$q \leq 0.25\%$ of L

Toolox® ovality guarantee

Tolerances for bars with turned surfaces are according to EN 10 060, meaning that the deviation of roundness shall not exceed 75% of the diameter tolerance range.

TESTING TOOLOX® PRODUCTS

Unless otherwise agreed, inspection and testing are carried out and the results are reported as specified in the relevant material standard or in the product data sheets. When placing the order, always specify whether the material is to be subjected to special inspection, the scope of such inspection, and also the type of inspection document required.

Mechanical testing plate

Impact testing in accordance with ISO 148-1 and EN 10 025.
Hardness testing in accordance with EN ISO 6506-1.

Mechanical testing round bar

Bar hardness is measured according EN ISO 6506-1.
Impact testing according to EN 10 083, ISO 148-1.

Ultrasonic testing

Ultrasonic testing of plates is performed on thicknesses ≥ 6 mm and is used for detection of discontinuities.

Toolox® plates are ultrasonic tested according to EN 10 160 and Toolox bars are ultrasonic tested according to EN 10 308. Both plate and bars are delivered with extra demands according to specification SSAB V6.

Mechanical testing SM plates

SM plates are inspected and tested as Toolox plates and have similar properties, except:

- In the center of the plate thickness, approximatively ± 5 % of the actual plate thickness, the polishing properties may not fulfil the requirements of high demands. The explanation for these abbreviations is an increased risk for small porosities in the plate center.

Ultrasonic testing SM plates

Ultrasonic testing is performed according to EN 10 160 Class E₃S₃.

DISTRIBUTION OF INSPECTION DOCUMENTS

SSAB has a certificate system that electronically produces, distributes and records all types of inspection documents. The documents are delivered electronically as PDF files. The certificate system offers excellent opportunities for simple and rational handling of inspection documents.

Inspection documents

Unless otherwise agreed, certificates are issued in English in accordance with SS-EN 10 204:2004. The certificates include the particulars specified in the material standard, which usually include:

- Name of manufacturer.
- Clear reference to the purchase agreement and delivery batch.
- Material designation in accordance with the purchase agreement.
- Description of product.
- Nominal dimensions.
- Quantity.
- Results of inspection.
- Date of issue.

The following types are available:

Inspection certificate 3.1.

The inspection certificate declares that the products delivered conform to the requirements of the purchase agreement. The results of testing are shown for the products that will be delivered or on inspection batches comprising part of the products delivered. The document is validated by an inspection representative who is authorized by the manufacturer and who is independent of the production department.

Inspection certificate 3.2.

The inspection certificate declares that the products delivered conform to the requirements of the purchase agreement. The results of testing are shown for the products that will be delivered or on inspection batches comprising part of the products delivered. Document issued both by the inspection representative authorized by the manufacturer and either by an inspection representative authorized by the customer or by an inspector appointed in accordance with official regulations.

EXAMPLE OF A TOOLOX[®] PLATE CERTIFICATE

Inspection certificate EN 10 204 - 3.1		A02		Issuing department Quality inspection		A05		Purchaser order no		A07		Our order no		A08		Invoice no		A19		Certificate no and date		A03		SSAB EMEA AB, SE-613 80 OXELÖSUND, Sweden		A01					
Purchaser		A11		Product Tool steel		B01		Marking (Stamping) Manufacturer, MATERIAL ID		B06		Customer marks		B15																	
Quantity B08		Dimensions [mm]		T W L		B09-B11		Weight [kg]		B12		Deliv. Cond.		B04		Internal code		B16													
Consignee		A06		Standard/rules		Steel grade		B02																							
MATERIAL ID		B07																													
Chemical composition		C71-C92		Carbon equivalent etc		C93-C99																									
Heat no		C		Si		Mn		P		S		Cr		Ni		Mo		V		Ti		Cu		Al		Nb		B		N	
Test type		C04		Millcode		C00		Specimen position		C01		Direction		C02		Treatment		B05		Specimen type		C10		Temp [degr C]		C03		Test results			
Tensile test		Delivery condition		C11		C12		C13		Rp0.2 [MPa]		Rm [MPa]		A50 [%]																	
Impact test		Delivery condition		C42		C42		C42		C43		E [J]		E [J]		E [J]		Ave [J]													
Hardness test (HBW)		Delivery condition		C32		Ave																									
ULTRASONIC INSPECTION ACCORDING TO EN 10 160 WITH EXTRA DEMANDS ACCORDING TO SPECIFICATION SSAB V6																															
		This certificate is produced with EDP and valid without signature		Quality Inspection Department/ Name		Z02		It is hereby certified that the material described above complies with the requirements of the order.		Z01		A22		 PREHARDENED TOOL STEEL www.toolox.com																	

HOW TO READ A CERTIFICATE

Unless otherwise agreed, certificates are issued in english in accordance with SS-EN 10 204:2004. More information can also be found in EN 10 168. SSAB guarantees that the certificates are according to compliance and that the measured test result is according to the products preformed result.

The ground rule for a certificate is that every box contains information from the placed order data and the measured test result is from the specific ordered material. In the top end of the certificate you find reference information important for your and SSABs administration, this boxes are marked in the upper right corner with an A. This information is purchaser order no which is the customer reference number, SSABS order no, invoice No, certificate no and the date when the certificate was issued. Deviation in the certificates may occur between plate and bar.

Below the administration information you will find information around the ordered product and it´s visible appearance, these boxes are marked in the upper right corner with an B. This includes; marking, purchaser, consignment address, customer marks the product dimension and weight, delivery condition, steel grade and reference number. This section ends with the material ID, which is the product reference number from the production.

Next section includes measured testing results and information of special agreement, these text boxes are marked in the upper right corner with a C. The box number are broken down by sections and specified below. The las section is certificate of complaint with who the order and by who it is certified.

Administration and delivery information

A01 - Production site where the certificates is issued from.
A02 - Control standard.
A03 - Certificate number and the issued date.
A04 - Product logo and web address.
A05 - Issuing dep, whom responsible for the document.
A06 - Consignee /delivery address.
A07 - Purchasers own reference (order) number.
A08 - SSABs order number.
A11 - Purchaser.
A19 - Invoice number.
A22 - CE mark.

Product information

B01 - Ordered product.
B02 - Standard/rules and steel grade.
B04 - Delivery conditions.
B05 - Treatment.
B06 - Marking (stamping) on the plate.
B07 - Material ID.
B08 - Quantity, the amount of ordered plates.
B09 - B011 - Thickness, width and length.
B12 - Weight in kg.
B15 - Customer marks.
B16 - internal reference number.

Mechanical testing and result

C00 - Millcode, test sample id.
C01 - Specimen position on the plate.
C02 - Test direction, transverse/along.
C03 - Temperature the test was performed in.
C04 - Test type.
C10 - Specimen type.
C71 - C92 - Chemical composition result.
C93 - C99 - carbon equivalent equation.

Control information

Z01 - Certificates of compliance.
Z02 - Signatures from quality department.

MARKING TOOLOX[®] PLATE

All plate are clearly marked on delivery. The steel grade and the plate identity are stamped, unless the relevant standard specifies no stamping or after special agreement.

Plate identity

The plate identity is specified by two digit groups of 6 digits, representing the heat number, + 6 digits that represent the plate serial number. These two groups of digits give every plate a unique identity. Example of Toolox plate identity: 123456-123456.

Marking and stamping

The steel grade and plate identity are always low-stressed stamped perpendicular to the rolling direction. For products without stamping, the steel grade and product identity are marked and the rolling direction is ink marked with arrows. Marking with paint may be carried out in the direction of rolling.

The customer's mark, product dimensions of length, width and thickness, product identity and the pile number for internal use are marked on the product. The marking is performed with white paint dot-matrix printing or black ink jet marking. The location of the stamp is occasionally indicated with two white-painted dots.

Brand marking

Unless otherwise agreed, to maintain traceability of the material at its destination SSABs products are marked as follows; Painted product is normally marked in a number of rows over the entire product upper surface. Unless otherwise agreed, a simplified steel grade designation and SSAB are painted. The product identity number can also be marked in rows over the product surface.

Note that the complete steel grade designation in accordance with the standard/data sheet or specification is stamped or is included in the paint marking.

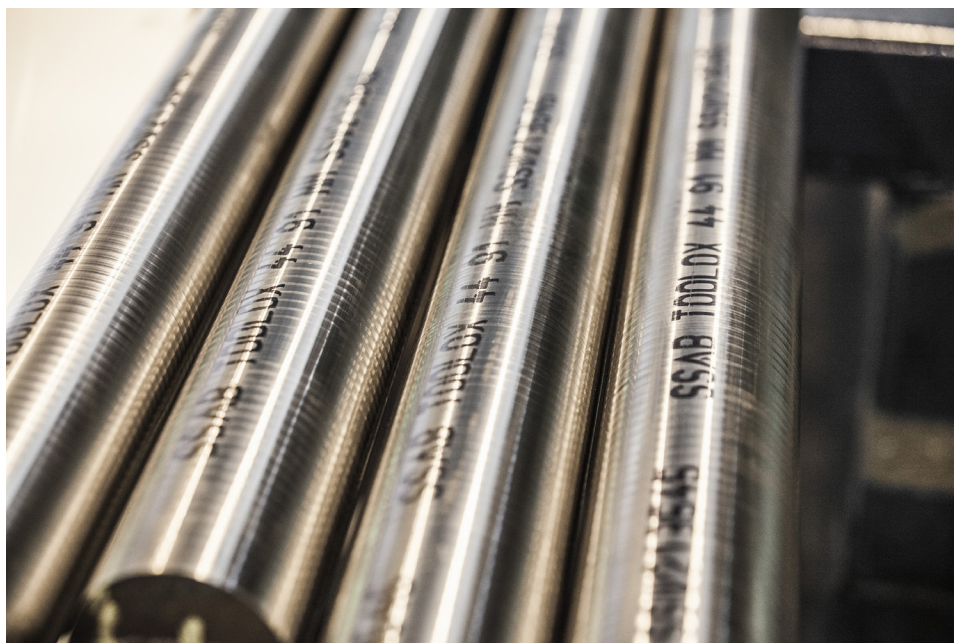
MARKING TOOLOX® ROUND BAR

All bars are clearly marked on delivery. Standard marking of Toolox® round bars contains SSAB logotype followed by product grade, the bar diameter and ends with the bar identity.

Example of a standard marking;

SSAB Toolox 33 43 mm ABC 123456
Customer specific marking upon agreement.

For bars with a diameter < 202, marking is performed with ink repeatedly along the turned surface. See photo down below for an example of SSAB marking along a turned surface.



For bars with a diameter ≥ 202 , marking is performed with stamping at one bar end.

ANTI-CORROSION PAINTING OF TOOLOX® PLATE

Unprotected steel plate will corrode. SSAB can therefore provide the plate with effective anti-corrosion treatment known as shop primer. This protects the plate while it is in transit.

The primer types that are used have been tested by various institutes to ensure good working conditions for the end user. If good ventilation is provided, the hygienic limit values will not be exceeded in conjunction with welding, cutting or grinding.

Regardless of the anti-corrosion treatment specified, the appearance and cleanliness of the steel surface before treatment are decisive to the effectiveness of the anti-corrosion treatment. SSAB shot-blasts the plate which is then immediately anti-corrosion painted. The primers used are mainly of low-zinc silicate type.

The plates which are kept in stock are painted with low-zinc silicate primer. In order to provide visual distinction, our steel grades are painted in different colors.

Toolox® 33 are delivered with grey color. Toolox® 40 and Toolox® 44 is delivered with red color.

Shop primers

Typ	Color	Protection time
Low zinc	red, grey	6 months

Other primer types are available subject to special agreement. Degree of blasting SA 2.5 as per ISO 8501-1.

SURFACE CONDITION TOOLOX[®] ROUND BAR

Toolox[®] bars are delivered with turned and oiled surface as standard treatment. Rolled surfaces can be supplied upon request.

Smoothness turned surface

Dimension \varnothing (mm)	Max. R_A (μm)
$\varnothing \leq 71$	2
$\varnothing > 75 \leq 141$	3
$\varnothing > 141$	16

PALLETIZING TOOLOX® PLATE

Our delivery standard presents rules and guidelines for palletizing the deliveries. When placing your order, always specify whether the material is to be subjected to special agreement.

The aim of the standard is to build the pallets in such a way that handling damage will be avoided to the greatest extent possible, and that we can create cost-effective and manageable volumes.

For deliveries in which SSAB is responsible for loading, the goods are always secured in accordance with the laws and regulations in force at that time. To regulate who pays for freight and insurance, we apply either CIP or CIF 2020 delivery conditions.

Concepts

Pallet	A platform loaded with packages. The pallets are separated with timber spacers measuring 63 x 90 mm.
Stack	A partial load on a pallet. Separated from other stacks by timber spacers measuring 32 x 32 mm.
Pallet label	A label attached to the top plate on a pallet containing the printed pallet number, bar code, painted color code, quantity, weight, and the identity of the top plate.
Color	Painted color coding on the short and/or coding long side of the plate for delivery by sea.
Short plate	Plate <6100 mm long.

General pallet rules

- The maximum pallet weight is 12 tonnes.
- Thick and thin plates are never loaded on the same pallet, when ordered from stock.
- Painted and unpainted plates are never loaded on the same pallet.
- The widest plate is always at the bottom on the pallet.
- Graduated width loading (widest plate on the pallet, gradually diminishing to the narrowest at the top) is employed for plate thicknesses <30.1 mm.
- Random length loading (plates of different lengths are loaded in random order) is employed.
- Some thin plate may be strapped.

Options

- Strapping with steel straps round both the pallet and the stack. 6099 mm maximum plate length.
- Stack weights as agreed.
- Pallet weights as agreed.
- Special color coding.
- Delivery codes outside the standard.
- Other requirements on dimensional separation.

Optional marking

- On the top plate on a pallet or stack. Up to 3 lines with 21 characters (manuell marking)* stack, up to 3 lines.
- Edge label attached on the thickness surface of the short side. Available in three variants with different information about the plate. Edge label possible above 8 mm thickness.

* Carried out free of charge, if required.

LOGISTIC OF TOOLOX[®] ROUND BAR

In the delivery standard, SSAB want to present the rules that guide the work of packaging and delivering bars and other long products. When placing your order, always specify whether the material is to be subjected to special agreement.

For deliveries in which SSAB is responsible for loading, the goods are always secured in accordance with the laws and regulations in force at that time. In order to regulate who will be paying for freight and insurance, SSAB mainly apply the following delivery conditions: CIP and CIF as per incoterms 2020. Exceptions can be made for certain conditions

Packing methods

Straps

- Straps are normally used for bars with rolled surface, but is ok for black material.
- 4 pieces of plastic straps around the bundle.
- Protection beneath the steel straps.
- Labels.
- Storage need to be free from rocks, dust etc.



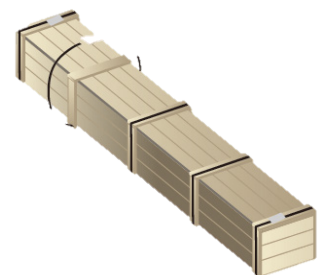
Lamell

- Normally used for bars with turned surface that are shipped by truck.
- Only packing material, limited protection against handling damages, corrosion.
- Bundle covered with lamina.
- 4 pieces of plastic straps around the bundle.
- Labels outside the lamina.



Wooden box

- Normally used for bars with turned surface that are shipped with deep sea transport.
- Export packing material in wooden box, gives good protection against handling damages and corrosion.
- The bundle covered with lamina.
- The bundle is put in a wooden box, with dry bags.
- The wooden box is strapped.
- Labels outside the wooden box.
- Storage does not impact products.
- Maximum weight 1 ton/box.



Options

Extra service of sawing into desired length can be ordered from SSABs central stock in Antwerp. One full bar always has to be invoiced and customers can choose to get the rest piece or not.

TOOLOX® PLATE DIMENSION INFORMATION

Mass, width and length

Toolox® standard delivery format is with unformatted edges and with extended width tolerance and extended length tolerance, see tables on page 3.

The delivered mass is determined by calculated weight based on specific dimensions. The specific width is measured at both ends and middle position of the plate, the specific length is measured near each mill edge along the plate. The specific thickness is measured according to EN 10 029.

Certain dimensions can be delivered with formatted edges with nominal dimensions, tolerances according to EN 10 029. Please contact your sales representative for detail information.

DEFINITIONS

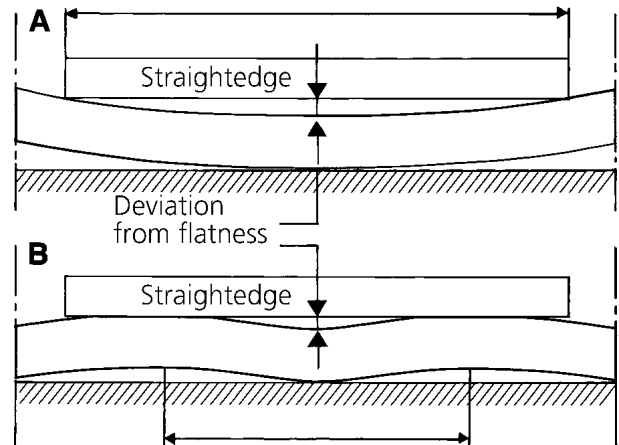
The information below is a presentation of how to inspect your SSAB deliveries using the product guarantees. This information is according to EN 10 029 for plate and EN 10 060 for round bar. For more information, please contact your local sales representant or Tech Support at techsupport@ssab.com.

Flatness measurement plate

To determine the flatness deviation during production, the plate is measured manually or by laser. The measurement conforms with manual procedure according to EN 10 029.

The plate is measured at least 25 mm from the long side of the plate and at least 200 mm from its short side. The vertical height is rounded off to the nearest mm. See figure A and B.

The flatness measurement shall always be performed when the plate is placed on a flat surface.

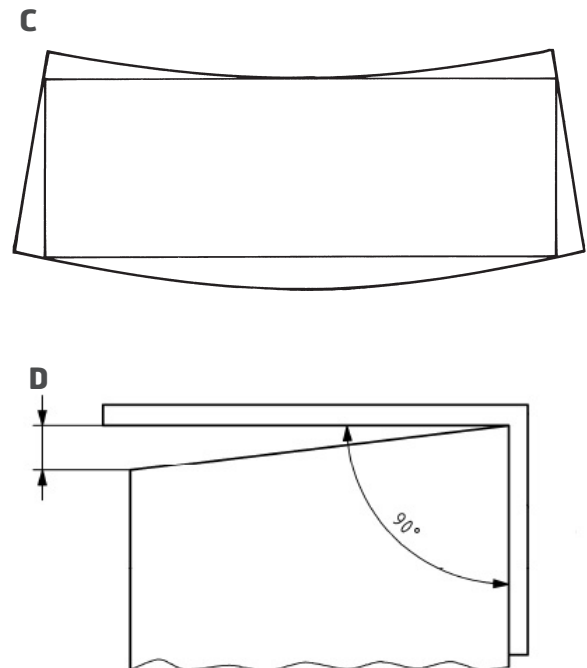


Edge camber and out-of-squareness plate

For plate specified with normal edge camber and out-of-squareness in the order, the edge camber and out of squareness shall be so that it is possible to inscribe a rectangle with the dimensions of the ordered plate within the delivered size.

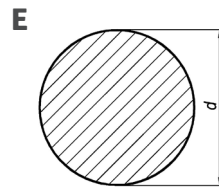
The edge camber value is the maximum deviation between the longitudinal edge and the straight line joining the two ends of this edge. It is measured on the concave edge of the plate, see figure C.

The out-of-squareness value is the orthogonal projection of one transverse edge on one longitudinal edge, see figure D.



Diameter measurement bars

The diameter shall be measured at any point situated at least 100 mm from the end of the bar. Shearing may deform the bar ends. See figure E.

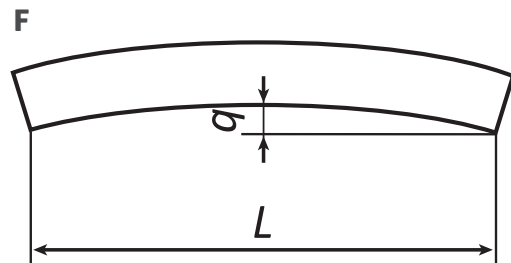


Length measurement bars

The length shall be measured as the longest length of the bar.

Straightness measurement bars

The straightness shall be measured over the total length (L) of the bar. See figure F.



Ovality measurement bars

The ovality shall be measured as the difference of the greatest diameter and the smallest diameter in the same plane perpendicular to the axis of the bar. The ovality shall be measured at any point situated at least 100 mm from the end of the bar.

SERVICE AND SUPPORT

SSAB has an extensive service and support offer.

SSAB have a long tradition of helping customers to develop their steel products and processes with our unique knowledge. Unlike other steel mills SSAB offers two different services, Tech Support and Knowledge Service Center. SSAB offer technical and innovation support as well as technical training, handbooks and tools.

SSAB offers advanced logistic solutions, including stock services world-wide, mill-direct deliveries, processing and logistics management solutions.

TOOLOX® DISTRIBUTION

Toolox® is almost always bought by the end customers cut to size. Sometimes also further steps such as machining and grinding are expected. To supply that market demand, SSAB has a close cooperation with a network of officially appointed distributors. A list of those distributors can always be found on the SSAB web pages www.ssab.com and www.toolox.com. In certain markets, SSAB also has the possibility to supply pieces directly.



CONTACT INFORMATION

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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 Nasdaq Stockholm and has a secondary listing on Nasdaq Helsinki. www.ssab.com.



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