

**DOMEX<sup>®</sup>**  
HIGH STRENGTH STEEL

**Stronger Steels  
for Stronger Customers**



**SSAB**





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A photograph of a construction site at dusk. A yellow CAT 330C excavator is in the process of loading a blue truck with a large pile of dark material, likely coal or ore. The scene is illuminated by the ambient light of the twilight sky and the headlights of the vehicles. The excavator's arm is raised, and its bucket is positioned over the truck's bed. The background shows a large, open-pit mine or quarry with steep, rocky walls.

## Advanced High Strength Steels and More

Staying competitive in today's heavy transport industry requires a new approach to product development. Products need to be made lighter, stronger, and more sustainable. The challenge is finding materials that display all of these attributes without affecting product quality or customer satisfaction.

Domex is a range of advanced high strength steels from SSAB developed to provide companies in the heavy transport industry with lower weight steel that is stronger in use. Domex steel also offers the environmental advantages of reduced deadweight, increased payloads, and a longer life than traditional steels. This helps you cut costs and produce more attractive products.

However, Domex is more than just steel – it is also a way of working together. SSAB strives to not only provide the highest quality steel, but to work side by side customers, sharing knowledge and building a long-term relationship. We call it “shared strength”. We support SSAB customers and do everything in our power to help them realize their potential and gain a competitive advantage.



**BENEFITS OF DOMEX:**

- ▶ Lower weight
- ▶ Stronger structure
- ▶ Simplified production
- ▶ Increased payload
- ▶ Longer life
- ▶ Environmental benefits
- ▶ Greater competitiveness



The excellent weldability of Domex means that all conventional methods of welding can be used.



The Advanced High Strength Steels combine high strength with good formability.



Thermal cutting of Advanced High Strength Steels can be done with different methods. Laser, plasma or gas cutting being the most common.

## HOW MUCH WEIGHT CAN YOU SAVE?

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Using Domex steel significantly reduces the weight of your finished products without losing its load capacity. The result will be a lighter product with increased performance. An easy way to calculate how much weight you can save is shown in figure 1. To assess thickness reduction, use the calculation shown in figure 2.

## DOMEX

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Domex is the brand name of SSAB's hot-rolled products and is available as advanced high strength cold-forming steel in thicknesses between 2 and 12 mm (figure 3). Corrosion-resistant steels, wear-resistant steels, sheet steels for ballistic protection and pole sheet steels are all members of the Domex family. These steels are well known on the market and are continuously being refined and developed to create new grades that provide even more benefits.

### Domex Advantages:

- Excellent formability in relation to high strength
- Good weldability
- Good impact toughness at low temperatures
- Suitable for laser cutting
- Suitable for hot-dip galvanising.

### Domex at a Glance

**Domex MC** – high strength, cold-forming steels renowned for their high strength, excellent formability and good weldability.

**Domex 960 and Domex 1200** – structural steels for applications where material strength can be used to increase payload or reduce weight.

**Domex Wear and Domex Wear 360** – abrasion-resistant steels with good wear resistance (min 360–max 420 HB)

**Domex Corrosion Resistant** – corrosion resistant steel with an atmospheric protection.

**Domex Protect** – extra hard steel that provides good ballistic and penetration protection properties.

**Domex Pole** – magnetic, high strength steels suitable for generators.

## DOCOL

In the Domex family you will also find products named Docol. These are cold-reduced products with a thickness between 0.5 and 2.1 mm, that have been adapted for use in structural applications (figure 3). Corrosion-resistant steels, wear-resistant steels, and sheet steels for ballistic protection are all examples of Docol steels manufactured using special heat treatment and fast water quenching for higher strength and longer life.

### Docol Advantages:

- Excellent formability in relation to their high strength
- Tight thickness tolerances
- Good weldability
- Suitable for laser cutting.

### Docol at a Glance

**Docol 1000DP** – advanced high strength steel with tight thickness-tolerances, excellent formability and good weldability.

**Docol 1200M** – extreme strength steel with moderate formability and good weldability.

**Docol Wear 450** – abrasion-resistant steel with good wear resistance.

**Docol Corrosion Resistant** – corrosion resistant steel with an atmospheric protection.

**Docol Protect** – extra hard steel with good ballistic and penetration protection properties.

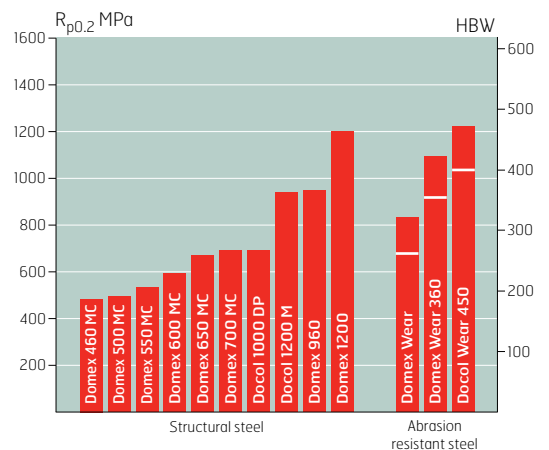
FIGURE 1 Rule of thumb



FIGURE 2 Upgrading-example



FIGURE 3 Products AHSS Strip Product Division



## Superior Strength

Domex are produced in a modern plant under strict process control. The steels are micro-alloyed, metallurgical processes ensure high steel purity and each steel is finished in a carefully controlled rolling process that ensures consistent properties. What does this mean for the end product? Superior strength.



### ADVANTAGES:

- ▶ Excellent formability in relation to high strength
- ▶ Good weldability due to their low contents of alloying elements
- ▶ Good impact toughness at low temperatures
- ▶ Suitable for laser cutting
- ▶ Suitable for hot-dip galvanising





## DOMEX MC

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Domex MC are modern, low-alloy structural steels for use in cold forming. Domex MC is available in six steel grades, ranging from 460 N/mm<sup>2</sup> up to 700 N/mm<sup>2</sup> (figure 3) and meets the requirements for the EN 10149-2 standard.

### Domex MC features:

- Tighter minimum bending radii (table 1)
- High yield strength/tensile relationship
- High impact toughness (table 2)
- Thickness range of 2–12 mm, depending on grade of steel
- Widths ranging from 800–1600 mm, depending on yield strength and thickness.



## DOMEX 960 AND DOMEX 1200

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Domex 960 and Domex 1200 are structural steels useful in applications where the strength of the material can be used to increase payload or reduce the weight. Cranes, lifting-equipment and trailers in the transport-industry are just some examples of heavy transport products that can benefit from Domex 960 and Domex 1200. Grade designations correspond to the minimum yield strength in the rolling-direction, ranging from 960 N/mm<sup>2</sup> up to 1200 N/mm<sup>2</sup> (figure 3).

### Domex 960 and Domex 1200 features:

- High yield strength/tensile strength relationship
- High internal purity and can be bent along and across rolling directions (table 4)
- High impact toughness
- Thickness range of 5–6 mm (Domex 960)
- Widths ranging from 1000–1500 mm, depending on thickness.

## DOMEX WEAR AND DOMEX WEAR 360

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Domex Wear and Domex Wear 360 enable you to reduce weight and extend the life of utility products that are subjected to wear. These steels can be used in products such as pipes for grain, abrasive sturry or concrete pumps, conveyers, truck bodies, feeders, loader buckets, concrete mixers, timber grapples and more. With wear-resistant and formable steel, the need for hardening is eliminated, contributing to a smoother production flow.

### Domex Wear and Dome Wear 360 features:

- Improved wear resistance
- High strength and toughness
- Excellent weldability and bendability
- Thickness range of 3–6 mm
- Widths ranging from 1000–1600 mm, depending on thickness.

**TABLE 1** Mechanical properties of Domex MC-steels

Steel grade	Yield strength $R_{eH}$ (N/mm <sup>2</sup> ) min.	Tensile strength $R_m$ (N/mm <sup>2</sup> ) min.–max.	Elongation min. (%)		Bending radius min. $t \leq 3$ mm	Bending radius min. $3 < t \leq 6$ mm	Bending radius min. $t > 6$ mm
			$A_{80}$ $t < 3$	$A_5$ $t \geq 3$			
Domex 460 MC	460	520–670	15	19	0.5 x t	0.7 x t	0.9 x t
Domex 500 MC	500	550–700	14	18	0.6 x t	0.8 x t	1.0 x t
Domex 550 MC	550	600–760	14	17	0.6 x t	1.0 x t	1.2 x t
Domex 600 MC	600	650–820	13	16	0.7 x t	1.1 x t	1.4 x t
Domex 650 MC	650*)	700–880	12	14	0.8 x t	1.2 x t	1.5 x t
Domex 700 MC	700*)	750–950	10	12	0.8 x t	1.2 x t	1.6 x t

The bending guarantee is for a 90° bend in practical application.

\*) For thicknesses >8 mm, the minimum yield strength may be 20 N/mm<sup>2</sup> lower.

**TABLE 2** Impact toughness of Domex MC-steels

Designation suffix	Test temperature	Energy level	Grades
B	Not impact tested		Domex 460 MC B–Domex 650 MC B
D	-20°	40 J	Domex 460 MC D–Domex 700 MC D
E	-40°	27 J	Domex 460 MC E–Domex 700 MC E

Impact strength D can be guaranteed for thicknesses up to 12 mm, and impact strength E can be guaranteed for thicknesses up to 10 mm.

Charpy V testing is carried out on the material in the direction of rolling in accordance with EN 10045-1 for thicknesses from 6 mm upwards.

**TABLE 4** Mechanical properties of Domex 960

Steel grade	Yield strength $R_{eH}$ (N/mm <sup>2</sup> ) min.	Tensile strength $R_m$ (N/mm <sup>2</sup> ) min.	Elongation min. (%)		Bending radius min. $3 < t \leq 6$ mm
			$A_{80}$ $t < 3$	$A_5$ $t \geq 3$	
Domex 960	960	980–		8	3.0 x t

The bending guarantee is for a 90° bend.

**TABLE 5** Impact toughness of Domex 960

Thickness mm	Test temperature	Impact energy min.
$t < 6$	Not impact tested	Not impact tested
$t \geq 6$	-40 °C	34 J/cm <sup>2</sup>

**TABLE 7** Mechanical properties Domex Wear, Domex Corrosion Resistant and Domex Protect

Steel grade	Yield strength $R_{eH}$ (N/mm <sup>2</sup> ) min.	Tensile strength $R_m$ (N/mm <sup>2</sup> ) min.	Hardness Typical values	Bending radius min. $t \leq 3$ mm *)	Bending radius min. $3 < t \leq 6$ mm *)
<b>Domex Wear</b>					
Domex Wear	(790) typical value	850	approx. 285 HBW	2 x t	2 x t
Domex Wear 360	1000 typical value	1250	min. 360– max. 420 HBW	3 x t	3 x t
<b>Domex Weather Resistant</b>					
Domex 550 W	550	600		1 x t	1 x t
Domex 700 W	700	750		2 x t	2 x t
<b>Domex Protect</b>					
Domex Protect 300			approx. 300 HBW	2 x t	2 x t
Domex Protect 500			approx. 500 HBW	5 x t	5 x t

\*) Min. bending radius for 90° bend.

The bending guarantee is for a 90° bend.

## DOMEX CORROSION RESISTANT

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Initially, Domex Corrosion Resistant steel corrodes in exactly the same way as ordinary carbon steels, but a uniform dense oxide film (patina) soon forms on the steel surface. The oxide film remains firmly in place and prevents moisture from penetrating through it and causing corrosion of the steel. Domex Corrosion Resistant steel can be used in products like containers, where high strength and resistance to corrosion reduces the need for maintenance, prolongs life and simplifies production. The material also offers major benefits for industrial chimneys, both externally and in the flue gas passages, since the corrosion-resistant steels can cope well with sulphurous environments. In addition to have good resistance to corrosion, Domex Corrosion Resistant steel is also characterized by good formability, weldability and impact strength. It is produced in two strength levels and the guaranteed minimum yield strengths are 550 N/mm<sup>2</sup> and 700 N/mm<sup>2</sup>. For more information about Domex Corrosion Resistant, ask for a separate brochure.

### Domex Corrosion Resistant features:

- Corrosion resistant properties
- Thickness range of 3–6 mm
- Widths ranging from 900–1600 mm, depending on yield strength and thickness.

## DOMEX PROTECT

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Domex Protect is ballistic protection steel that can be used for protecting cars and security vehicles that may be exposed to small arms fire. The steel can also be used as protection against burglaries, such as in safety doors. For more information about Domex Protect, ask for a separate brochure.

### Domex Protect features:

- Thickness range of 2–8.2 mm
- Hardness of up to 500 HBW
- Widths ranging from 900–1500 mm
- Lighter weight than conventional protective steel.

## DOMEX POLE SHEET

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Domex Pole Sheet is a steel with good magnetic properties, a low content of alloying elements and is perfect for making rotor rings and the poles of generators. Its consistent mechanical properties and good flatness make the sheet steel very well suited for automatic punching and laser cutting. Hot-rolled Pole sheet is produced with yield strengths of up to 700 N/mm<sup>2</sup>.

### Domex Pole Sheet features:

- Good magnetic properties
- Thickness of 2–5mm
- Widths ranging from 800–1600 mm, depending on yield strength and thickness.

## DOMEX – DELIVERY DIMENSIONS, FORMS AND TOLERANCES

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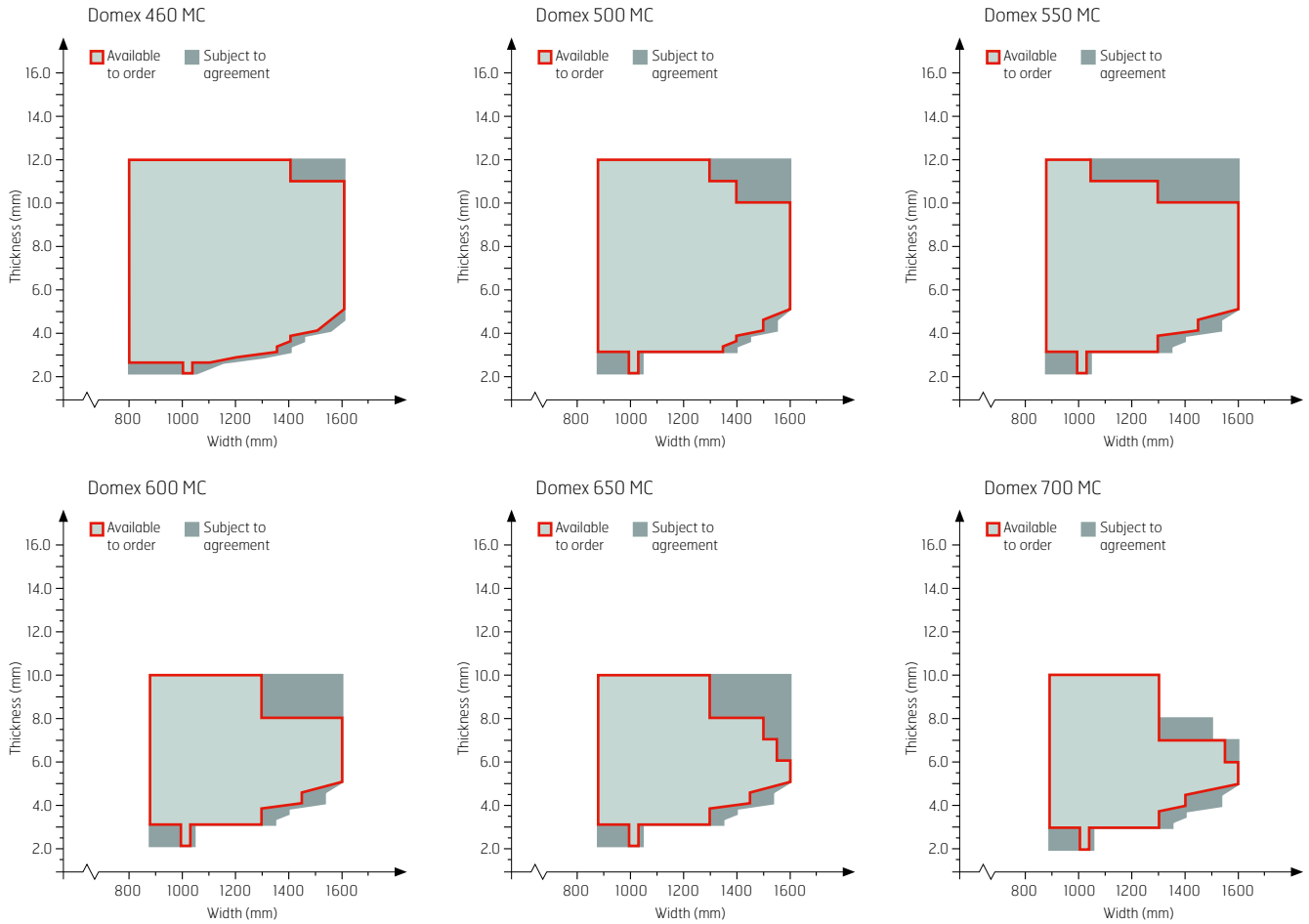
Domex can be supplied as coils, slit coil or cut-to-length sheets. The steels can be supplied with mill-edge or pickled and oiled surface, and also with mill edges or cut-edges.

### Coils

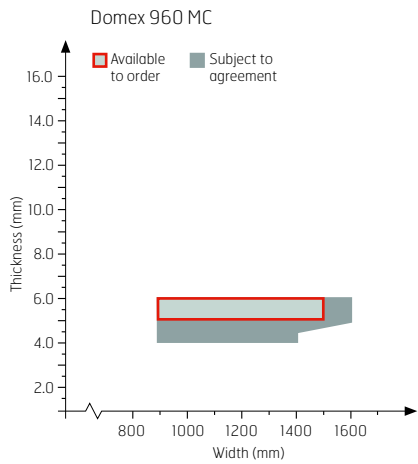
The delivery range for Domex in coils with as-rolled surfaces and mill edges are:

- Diagram 1, for Domex 460MC, Domex 500MC, Domex 550MC, Domex 600MC, Domex 650MC, Domex 700MC;
- Diagram 2, for Domex 960;
- Diagram 3, for Domex 1200;
- Diagram 4, for Domex Wear;
- Diagram 5, for Domex Wear 360.

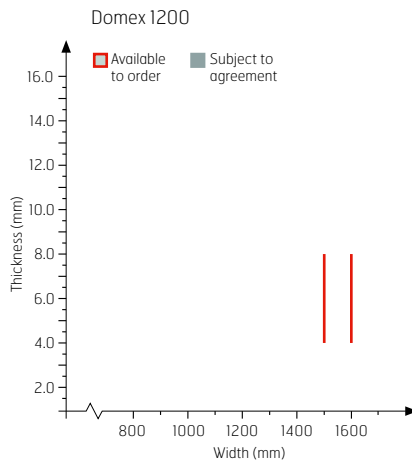
**DIAGRAM 1** Product program Domex MC-steels



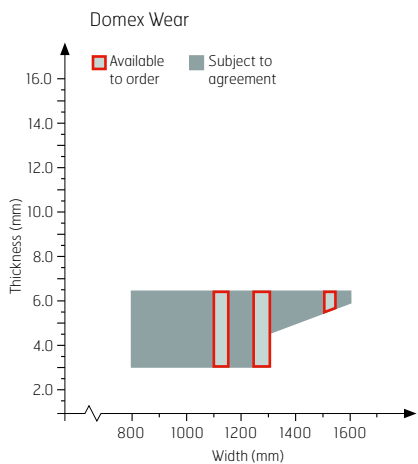
**DIAGRAM 2** Product program Domex 960



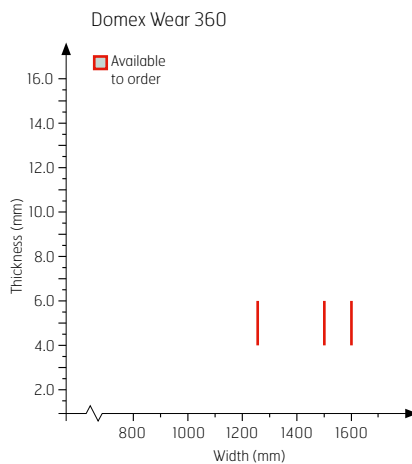
**DIAGRAM 3** Product program Domex1200



**DIAGRAM 4** Product program Domex Wear



**DIAGRAM 5** Product program Domex Wear 360





### Tolerances

Domex steels are normally supplied with tolerances in accordance to EN 10051, however, SSAB is able to produce even narrower tolerances in accordance with the SSAB in-house standard. Narrower tolerances are subject to special agreement (table 12).

### Surface finish

Domex steel can be supplied with as-rolled or pickled surfaces. To prevent corrosion, pickled sheet is usually oiled, but also available for dry delivery.

**TABLE 12** Tolerances on thickness for Domex-AHSS, according to EN10051 and SSAB tolerances

Thickness, mm	Normal tolerance as per EN 10051		Tolerance as per SSAB	
	Width≤1200	Width>1200	Width≤1200	Width>1200
– 2.0 mm	± 0.17 mm	± 0.19 mm	± 0.13 mm	± 0.14 mm
(2.0) – 2.5 mm	± 0.18 mm	± 0.21 mm	± 0.14 mm	± 0.16 mm
(2.5) – 3.0 mm	± 0.20 mm	± 0.22 mm	± 0.15 mm	± 0.17 mm
(3.0) – 4.0 mm	± 0.22 mm	± 0.24 mm	± 0.17 mm	± 0.18 mm
(4.0) – 5.0 mm	± 0.24 mm	± 0.26 mm	± 0.18 mm	± 0.20 mm
(5.0) – 6.0 mm	± 0.26 mm	± 0.28 mm	± 0.20 mm	± 0.21 mm
(6.0) – 8.0 mm	± 0.29 mm	± 0.30 mm	± 0.22 mm	± 0.23 mm
(8.0) – 10.0 mm	± 0.32 mm	± 0.33 mm	± 0.24 mm	± 0.25 mm
(10.0) – 12.5 mm	± 0.35 mm	± 0.36 mm	± 0.26 mm	± 0.27 mm
(12.5) – 15.0 mm	± 0.37 mm	± 0.38 mm	± 0.28 mm	± 0.29 mm
(15.0) – 16.0 mm	± 0.40 mm	± 0.42 mm	± 0.30 mm	± 0.32 mm

Closer tolerances on thickness are available for cut-to-length sheet, pickled coils and slit strip.



## Lighter Weight

Docol is the product name for cold reduced sheet steel from SSAB and you will also find them as products in the Domex family. The raw material for producing cold-reduced steel sheet is hot rolled in our hot-strip mill. The strip is then pickled, and cold reduced to produce thinner sheet with close thickness tolerances. Finally, the material is annealed using a special heat treatment in the continuous annealing line providing you with high strength steel that is lighter in weight.

### DOCOL 1000 DP

Docol 1000 DP is a dual-phase steel that is subjected to special heat treatment in the continuous annealing line. It is characterized by low yield strength in relation to the tensile strength, so it has the ability to distribute plastic deformation during working. The final strength of a finished part can be achieved by strain hardening during roll forming, pressing or bending, and by bake hardening in conjunction with painting.

#### Docol 1000DP features:

- Low yield strength in relation to tensile strength
- Thickness range from 0.5–2 mm
- Widths ranging from 800–1500 mm.

### DOCOL 1200 M

Docol 1200M is a fully martensitic steel (one-phase-steel) best suited for bending, roll-forming, simple pressing operations and tube making. The strength and microstructure are produced during the production in the continuous annealing line by extremely fast water quenching.

#### Docol 1200M features:

- Very high yield strength/tensile strength ratio
- Thickness range from 0.5–2 mm
- Widths ranging from 800–1500 mm.



**TABLE 13** Mechanical properties of Docol 1000 DP and Docol 1200 M

Steel grade	Yield strength (N/mm <sup>2</sup> ) min.	Yield strength after bake hardening (N/mm <sup>2</sup> ) min.	Tensile strength (N/mm <sup>2</sup> ) min.	Elongation A <sub>B0</sub> min.	Bending radius 90° bend min.
Docol 1000 DP	700	850	1000	7	2.0 x t
Docol 1200 M	950	1150	1200	3	3.0 x t

t = sheet thickness



**ADVANTAGES:**

- ▶ Excellent formability in relation to their high strength
- ▶ Tight thickness tolerances
- ▶ Good weldability
- ▶ Suitable for laser cutting



## DOCOL WEAR 450

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Docol Wear 450 is a cold reduced, continuously annealed quenched and tempered steel with excellent wear resistance. Docol Wear can be used for such things as concrete mixers and agricultural equipment, which are constantly subjected to abrasive wear by hard particles like sand, gravel, pebbles and grain.

### Docol Wear 450 features:

- Excellent wear resistance
- Good formability and weldability
- Thickness range from 0.5–2 mm
- Widths ranging from 800–1500 mm.

## DOCOL CORROSION RESISTANT

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Docol Corrosion Resistant steel is made for use in containers and other products subject to corrosion and benefiting from a reduced tare weight. Initially, the steel will corrode in the same way as ordinary carbon steels, but it will then form a uniform dense oxide film (patina) on the steel surface. The oxide film will remain firmly in place and prevents moisture from penetrating through it and causing corrosion of the steel.

### Docol Corrosion Resistant features:

- Corrosion resistant properties
- High resistance to impact and wear
- Good formability and weldability
- Thickness range from 0.5–2 mm
- Widths ranging from 900–1400 mm.

## DOCOL – DELIVERY DIMENSIONS, FORMS AND TOLERANCES

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Docol can be supplied as coils, slit coil or cut-to-length sheet. The steels will be delivered with cut edges and the surface can be oiled or dry.

### Coils

All Docol can be delivered as coil to the customer, according to the delivery ranges shown in diagram 4 for Docol 1000DP, in diagram 5 for Docol 1200M and in diagram 6 for Docol Wear 450.

### Tolerances

Docol are normally supplied with tolerances in accordance to EN 10131 (table 16), but SSAB is able to produce even narrower tolerances in accordance with the SSAB in-house standard. Narrower tolerances on thickness and width are subject to special agreement.

### Surface finish

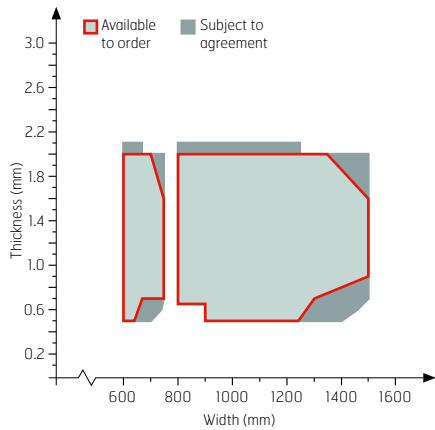
Docol sheet is normally protected by a coat of anti-corrosion oil before delivery. Anti-corrosion press oil can be used instead, if requested. Sheet can be delivered in dry condition upon request.

**TABLE 15** Hardness and bendability of Docol Wear 450

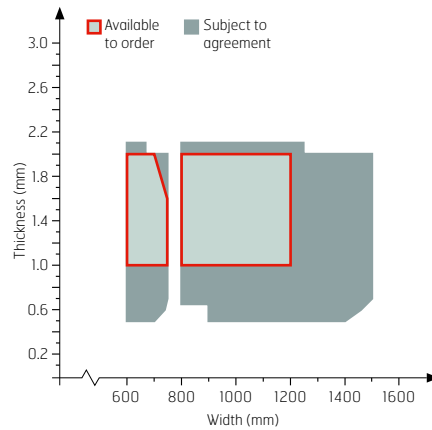
HARDNESS (Typical values)				BENDABILITY
Steel grade	Brinell	Rockwell	Vickers	Min. bending radius 90° bend
Docol Wear 450	440	43	456	3.0 x t

t = sheet thickness

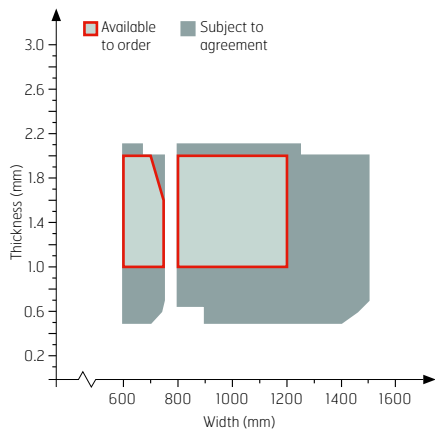
**DIAGRAM 4** Product program Docol 1000 DP



**DIAGRAM 5** Product program Docol 1200 M



**DIAGRAM 6** Product program Docol Wear 450



**TABLE 16** Thickness-tolerances for Docol-steels

Nominal thickness, mm	Normal tolerance for nominal width, mm	
	≤1200	>1200≤1500
>0.40≤0.60	± 0.05	± 0.06
>0.60≤0.80	± 0.06	± 0.07
>0.80≤1.00	± 0.07	± 0.08
>1.00≤1.20	± 0.08	± 0.09
>1.20≤1.60	± 0.10	± 0.11
>1.60≤2.00	± 0.12	± 0.13
>2.00≤2.50	± 0.14	± 0.15

Delivered with normal tolerances unless otherwise specified.

The thickness is measured at distance of at least 40 mm from the edge of the sheet.

SSAB is a global leader in value added, high strength steel. SSAB offers products developed in close cooperation with its customers to reach a stronger, lighter and more sustainable world.

SSAB employs 10 000 people in over 45 countries around the world and operates production facilities in Sweden and the US. SSAB is listed on the NASDAQ OMX Nordic Exchange, Stockholm.

For more information, contact us or visit [www.ssab.com](http://www.ssab.com)

**SSAB Tunnpått AB**

SE-781 84 Borlänge  
Sweden

T +46-243 700 00

F +46-243 720 00

E [office@ssabtunnplat.com](mailto:office@ssabtunnplat.com)

[www.ssab.com](http://www.ssab.com)

**SSAB**