

## SSAB Laser® 420ML Plus

### General Product Description

SSAB Laser® 420ML Plus is an advanced thermomechanically rolled weldable fine grain steel for laser cutting and cold forming. The SSAB guarantee for flatness, both before and after laser cutting, is  $\leq 3$  mm/m deviation.

SSAB Laser® 420ML Plus meets and exceeds the requirements of S420ML in EN 10025-4. Dual certification and CE marking are available upon request.

### Dimensions

Delivery form	Thickness (mm)	Width (mm)	Length (mm)
Hot rolled plate	10.0- 25.0	1000- 3300	2000- 15000

### Mechanical Properties

Delivery form	Yield strength $R_{eh}$ (min MPa)	Tensile strength $R_m$ (MPa)	Elongation $A_5$ (min %)	Min inner bending radius 90°* (x t)
Hot rolled plate	420	520- 680	19	1.0

The mechanical properties are tested transverse to the direction of rolling.

\*The bending guarantee is valid for both longitudinal and transverse direction.

### Impact Properties

Grade	Min longitudinal test impact energy
SSAB Laser® 420ML	40J /-50°C

Impact strength is tested by the Charpy V test in accordance with EN ISO148-1:2016. Impact energy value  $\geq 40$ J is guaranteed for test piece size 10 x 10 mm.

When testing thickness  $<10$  mm, the width of the test pieces correspond with the plate thickness. The values decrease in direct relation to the surface area of the test piece.

### Chemical Composition (Ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	CEV (max)
0.12	0.03	1.6	0.020	0.015	0.38

All SSAB Laser® steels are aluminum-killed (Al  $\geq 0.015\%$ ) and grain-refined. Additionally, niobium (Nb), vanadium (V), titanium (Ti) and/or boron (B) may be used as single alloying element or in any combination.

$$CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

### Tolerances

All SSAB Laser® products are delivered with SSAB Laser® tolerances, which means increased guarantees compare to corresponding EN standards. Detailed information is available on [ssab.com](http://ssab.com).

#### Thickness

SSAB Laser® tolerances correspond to  $\frac{3}{4}$  of EN 10 029:2011 as default.

#### Width

-0/+4-10mm depending on the thickness.

**Length**

Nominal plate length l (mm)	Tolerance (mm)
$2000 < l \leq 10000$	-0 / +15
$10000 < l \leq 15000$	-0 / +20

**Shape**

According to EN 10 029:2011.

**Flatness**

$\leq 3$  mm/m flatness deviation for both delivery condition and laser cut parts.

**Surface Properties**

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

**Delivery Conditions**

Thermo-mechanically rolled.

**Surface and edge condition**

Hot rolled plate: as rolled surface condition and cut edges as default.

**Fabrication and Other Recommendations**

All SSAB Laser® products have been optimized for laser cutting, cold forming and welding.

SSAB Laser® 420ML Plus is a thermomechanically rolled weldable fine grain steel for laser cutting and cold forming. It is not suited for heat treatments at temperatures above 580°C, since the material then may lose its guaranteed properties.

For information concerning fabrication, please visit [ssab.com](http://ssab.com), consult your local contact person or contact SSAB's Tech Support organization by e-mail at [techsupport@ssab.com](mailto:techsupport@ssab.com).

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

**Contact Information**

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

## SSAB Laser® 420MC Plus

### General Product Description

SSAB Laser® 420MC Plus is an advanced high yield strength cold forming steel for laser cutting. The SSAB guarantee for flatness, both before and after laser cutting, is  $\leq 3$  mm/m deviation.

SSAB Laser® 420MC Plus meets and exceeds the requirements of S420MC in EN 10 149-2. Dual certification is available upon request.

### Dimensions

Delivery form	Thickness (mm)	Width (mm)	Length (mm)
Hot rolled sheet as rolled	2.0- 12.0	1000- 1860	1000- 16000
Hot rolled sheet pickled and oiled	2.0- 10.0	1000- 1860	1000- 16000

### Mechanical Properties

Delivery form	Yield strength $R_{eh}$ (min MPa)	Tensile strength $R_m$ (MPa)	Elongation $A_{80}^{1)}$ (min %)	Elongation $A_5^{2)}$ (min %)	Min inner bending radius 90°* (x t)
Hot rolled sheet	420	490- 620	16	21	0.0

The mechanical properties are tested longitudinal to the direction of rolling.

<sup>1)</sup>  $A_{80}$  value applies for thicknesses  $< 3.00$  mm.

<sup>2)</sup>  $A_5$  value applies for thicknesses  $\geq 3.00$  mm

\*The bending guarantee is valid for both longitudinal and transverse direction.

### Impact Properties

Grade	Longitudinal Test Impact Energy
SSAB Laser® 420MC Plus	40J /-60°C

Impact strength is tested by the Charpy V test in accordance with EN ISO148-1:2016. Impact energy value  $\geq 40$  J is guaranteed for test piece size 10 x 10 mm.

When testing thickness  $< 10$  mm, the width of the test pieces correspond with the plate thickness. The values decrease in direct relation to the surface area of the test piece. No impact tests are carried out for thicknesses  $< 6$  mm.

### Chemical Composition (Ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (max %)	S (max %)	CEV (max)
0.12	0.03	1.5	0.020	0.015	0.28

All SSAB Laser® steels are aluminum-killed (Al  $\geq 0.015\%$ ) and grain-refined. Additionally, niobium (Nb), vanadium (V), titanium (Ti) and/or boron (B) may be used as single alloying element or in any combination.

$$CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Cu + Ni}{15}$$

### Tolerances

All SSAB Laser® products are delivered with SSAB Laser® tolerances, which means increased guarantees compare to corresponding EN standards. Detailed information is available on [ssab.com](http://ssab.com).

#### Thickness

SSAB Laser® tolerances correspond to  $\frac{3}{4}$  of EN 10 051:2010 as default. Tighter tolerances are available upon request.

#### Width

-0/+20 mm for mill edge; -0/+2 mm for cut edge sheet. Tighter tolerances are available upon request.

**Length**

Nominal sheet length $l$ (mm)	Tolerance (mm)
$l \leq 4000$	-0 /+3
$4000 < l \leq 6000$	-0 /+4
$6000 < l \leq 8000$	-0 /+5
$8000 < l \leq 13000$	-0 /+6
$13000 < l \leq 16000$	-0 /+8

**Shape**

According to EN 10 051:2010.

**Flatness**

$\leq 3$  mm/m flatness deviation for both delivery condition and laser cut parts.

**Surface Properties**

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

**Delivery Conditions**

SSAB Laser® 420MC Plus is delivered in thermo-mechanically rolled condition.

**Surface and edge condition**

SSAB Laser® 420MC Plus is available in as rolled or pickled and oiled surface condition with mill edge. Cut edge sheets are available upon request.

**Fabrication and Other Recommendations**

All SSAB Laser® products have been optimized for laser cutting, cold forming and welding.

SSAB Laser® 420MC 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, please visit [ssab.com](http://ssab.com), consult your local contact person or contact SSAB's Tech Support organization by e-mail at [techsupport@ssab.com](mailto:techsupport@ssab.com).

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

**Contact Information**

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