

# Strenx 650 MC

## Advanced High Strength steel

### General Product Description

Strenx 650 MC is a hot-rolled structural cold-forming steel with a minimum yield strength of 650 MPa intended to give stronger and lighter structures. Strenx 650 MC meet or exceed the requirements of S650MC in EN 10149-2.

Typical applications are a wide range of components and parts for example demanding load bearing structures.

#### Available dimensions

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

Yield strength R <sub>eH</sub> <sup>1)</sup> Min MPa	Tensile strength R <sub>m</sub> MPa	Elongation A <sub>80</sub> Min % Sheet thickness t < 3 mm	Elongation A <sub>5</sub> Min % Sheet thickness t ≥ 3 mm
650 <sup>2)</sup>	700 - 850	12	14

The mechanical properties are tested in the longitudinal direction.

<sup>1)</sup> If R<sub>eH</sub> is not applicable then R<sub>p0.2</sub> is used.

<sup>2)</sup> On thicknesses >8 mm the minimum yield strength may be 20MPa lower.

Impact properties	650 MC D -20°C	650 MC E -40°C
Minimum energy for test on longitudinal Charpy V 10x10 mm test specimens (J)	40	27

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

Bending properties	t ≤ 3 mm	3 mm < t ≤ 6 mm	t > 6 mm
Min. inner bending radius for a 90° bend	0.8xt	1.2xt	1.5xt

For both longitudinal and transverse direction.

### Chemical Composition (ladle analysis)

C % Max	Si % Max	Mn % Max	P % Max	S % Max	Al <sub>tot</sub> % Min	Nb % Max	V % Max	Ti % Max
0.12	0.21 <sup>1)</sup>	2.00	0.025	0.010	0.015	0.09 <sup>2)</sup>	0.20 <sup>2)</sup>	0.15 <sup>2)</sup>

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.

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

The steel is grain refined.

#### Carbon equivalent

	2 mm ≤ t ≤ 10 mm
CET / CEV Typical	0.22 / 0.34

$$CET = C + \frac{Mn + Mo}{10} + \frac{Cr + Cu}{20} + \frac{Ni}{40}$$

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

## Tolerances

More details are given on [www.ssab.com](http://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 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](http://www.ssab.com) or consult Tech Support, [techsupport@ssab.com](mailto:techsupport@ssab.com).

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

## Contact and Information

For information, see SSAB's brochures on [www.ssab.com](http://www.ssab.com) or consult Tech Support, [techsupport@ssab.com](mailto:techsupport@ssab.com).