

## 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 <sup>5)</sup>
2- 3	650	700- 850	12	14 <sup>4)</sup>	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.

<sup>1)</sup> If  $R_{eH}$  is not applicable then  $R_p 0,2$  is used.

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

<sup>3)</sup>  $A_{80}$  value applies for thicknesses < 3.00 mm.

<sup>4)</sup>  $A_5$  value applies for sheet thickness  $t \geq 3$ mm.

<sup>5)</sup> For both longitudinal and transverse direction.

### Impact Properties

Grade	Min. impact energy for longitudinal testing, Charpy V 10x10 mm test specimens
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  $\geq 6$ mm. The specified minimum value corresponds to a full-size specimen.

### Chemical Composition (ladle analysis)

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

<sup>1)</sup> 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.

<sup>2)</sup> Sum of Nb, V and Ti = max 0.22%

The steel is grain refined.

### Carbon equivalent CET(CEV)

Thickness (mm)	2.00 - 10.00
Typ CET(CEV)	0.22 (0.34)

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

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

## 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 our 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 Information

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