

Preliminary SSAB Weathering 420M/ML

Preliminary Product Sheet

Preliminary Product Sheets describe information for products that are still in trial delivery phase. Shown values represent the targeted requirements for the product, but are not guaranteed values. Also the availability of the product is subject to limitations and trial deliveries and their conditions have to be separately agreed upon.

General Product Description

The weather resistant SSAB Weathering 420M/ML steel grade is structural steel offering a good weather resistance. The steel have excellent usability properties. Its surface quality, dimensional accuracy and the consistency of its properties are among the best on the market. Thanks to its good properties, these steels promote environmentally sound construction and sustainable development.

SSAB Weathering 420M/ML brings clear performance benefits for heavy steel structures like bridges. Thanks to the excellent resistance to atmospheric corrosion, there is no need for the additional coatings, such as painting of steel structures. Therefore, a significant cost advantage can be achieved in applications, where a dark brown patina is desired on the steel surface. However, the steel surface can be color coated, using the same methods as when painting ordinary steel grades. As a result of the special alloying of the steel, the lifespan of the colour coating is double that of an ordinary steel grade.

The anti-corrosion properties of SSAB Weathering 420M/ML are much better than those of the ordinary structural steels which are commonly used in many outdoor applications. The enhanced weather resistance is based on the oxide layer, i.e. patina. The elegantly brown patinated surface is architecturally distinguished. Patina starts to be yellowish first and when the time goes on the color will turn to darker brown.

SSAB Weathering 420M hot rolled plate meets or exceeds the requirements of S420K2W in 10025-5:2019 by default . Furthermore SSAB Weathering 420ML meets or exceeds the requirements of S420J5W in 10025-5:2019. Upon agreement, they can be delivered dual certified. SSAB Raahe Works is authorized to use the CE marking for structural steels according to EN 10025-5 based on EN 10025-1.

The CE marking is marked on an extra page of inspection certification 3.1.

Dimension Range

SSAB Weathering 420M/ML is available in thickness 40.0 - 60.0 mm.

Mechanical Properties

Thickness (mm)	Yield strength R _{eH} (min MPa)	Tensile strength R _m (MPa)	Elongation A ₅ (min %)
40.00 - 40.00	400	520 - 660	17
40.01 - 63.00	390	520 - 660	16
63.01 - 65.00	380	520 - 660	15

The tensile test is made transversally to the rolling direction in compliance with EN 10025-1 and EN 10025-5.

Certificated:

SSAB Weathering 420M/ML provides two different certificates.

3.1 to SSAB Weathering 420M/ML.

3.1+CE to S420J2W+M / S420J5W+M upon request.

Impact toughness

Grade	Min. impact energy for longitudinal Charpy V-notch test	Test temperature
SSAB Weathering 420M	40 J	-20 °C
SSAB Weathering 420ML	27 J	-50 °C

The impact test is made longitudinally to the rolling direction in compliance with EN 10025-1 and EN 10025-5.

Chemical Composition (ladle analysis)

C (max %)	Si (max %)	Mn (max %)	P (%)	S (max %)	Cu (%)	Cr (%)	Ni (max %)
0.08	0.50	1.05	0.015	0.005	0.55	0.80	0.25

Carbon Equivalent

Thickness (mm)	CEV
40.0 - 65.0	0.37
CEV typical (%)	0.37
CEV max (max %)	0.42

Tolerances

Thickness $\frac{3}{4}$ from EN10029 Class A. Width and length according to EN10029.

Flatness 4 mm/m.

Surface according to EN 10163-2 Class A subclass 3.

Delivery Conditions

Thermomechanically rolled, M.

Coatings:

Possible to order as shot blasted & primed.

Fabrication and Other Recommendations

Welding:

The weldability of SSAB Weathering steels is excellent. All conventional welding methods can be used. If the welded structure shall be made according to standard EN 1090-2 rules, the selection of acceptable welding consumables shall follow EN 1090-2.

The need for preheating can be evaluated according to standard EN 1011-2 method A. Choosing of low hydrogen content welding consumables ($\leq 5 \text{ ml} / 100 \text{ g}$) will minimize the risk of hydrogen cracking and reduce the need for preheating. SSAB Weathering 420M/ML steels have relatively low CEV values. According to standard EN 1011-2, preheating is not required when low hydrogen content ($\text{HD} \leq 5 \text{ ml}/100 \text{ g}$) consumables are being used. When welding is performed by consumables with higher hydrogen content ($5 < \text{HD} \leq 10 \text{ ml}/100 \text{ g}$) and heat input values below 1.25 kJ/mm preheating is recommended. The recommended preheating temperature depends on the applied heat input and the combined thickness of the weld joint configuration according to EN 1011-2.

Forming:

Minimum inner bending radius $2 \times t$ can be used in both longitudinal and transverse direction in 90 degree three-point bending. Minimum die-width is recommended to be at least $10 \times t$. Close attention should be paid on the cut edges in the bend area and all excessive cracks or burrs should be removed. It is also important to be sure that the plate surface is defect free (no scratches) on the deformation area before bending.

For information concerning fabrication, see SSAB's brochures on www.ssab.com or consult Tech Support, 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