

Cold rolled weather resistant steel

Cold rolled atmospheric corrosion resistant steels are used uncoated and exposed to bad weather. Due to development of a protective oxide layer on the steel surface. That is why this steel is often called “weather resistant steel”.



Cold rolled weather resistant steel HC315WP

Cold rolled steel for atmospheric circumstances
covers/acc. EN 10025 (mill specs)

Properties

Cold rolled HC315WP steel offers improved resistance to atmospheric corrosion and is a thinner version of the hot rolled steel defined in the EN 100255: 2004 standard (S355J0WP). It is a fine grain, high strength structural steel that has been optimised to give improved processing and in service performance.

Advantages

When used uncoated and exposed to bad weather, an oxide layer develops on the steel surface, forming a blue-brown, finely grained patina that bonds very strongly to the steel and protects it. With their characteristic colour, HC315WP steels are used in architectural projects either to harmonise with the environment or to create a pleasing contrast with other materials, such as stainless steel. If the patina is damaged, the steel re-oxidises, thus repairing the patina and maintaining the protective barrier. HC315WP can also be coated (paint, metallic coatings etc.) In the case of coated parts, the protective layer prevents rust propagation under the paint layer. Experience has shown that the adhesion of organic coatings on HC315WP is superior to bonding on other carbon steel grades.

Applications

HC315WP has a wide range of applications: architecture, sculpture, engineering structures, containers and cable trays. When used uncoated, no maintenance is required and the material will not deteriorate through corrosion. The effectiveness of the corrosion protection largely depends on the speed of patina formation. For optimum patina formation, HC315WP can be used in a non-confined environment, even in the presence of sulphuric fumes. However, it is strongly recommended not to expose HC315WP to condensation or repeated soiling, particularly in environments containing free chlorine.

- Outdoor use: the patina forms naturally in the open air (over a period of three to four years). Variations in appearance will be observed, depending on the water condensation, evacuation and evaporation conditions. After a few years, the patina will stabilise, even in an industrial, sulphur containing or rural environment. To ensure optimum patina formation and limit the formation of rust streaks, the oxidation process can be accelerated artificially by first degreasing the surface and then subjecting it to alternate periods of dry and humid conditions.
- Indoor use: to preserve the natural appearance of the material and at the same time avoid powdery oxide deposits that may cause staining, the following four steps are recommended:
 1. First remove all dusts, stains or surface defects
 2. Apply a chemical treatment to those areas where corrosion has not yet developed
 3. Clean the surface with water, brush and dry
 4. Finally, apply a colourless, matt, UV-resistant varnish

- Use painted: as the surface has a high reactivity, it is recommended that the first coat of paint be applied on a clean surface immediately after degreasing.

Brand correspondence

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Therefore, HC315WP steels are compatible to:

MK code	Quality	Accordingly	Related alternative
MK 280	HC315WP	EN 10025-5: 2004	S355J0WP (1)

(1) *These grades have the same analytical requirements so as to obtain the same properties in terms of patina formation and process ability.*

Mechanical composition	Re (MPa)	Re (MPa)	A ₈₀ (%)	CEV (%)
Values	min. 315	min. 450	min. 22	max. 0.45

Chemical composition	C (%)	Mn (%)	P (%)	S (%)	Si (%)
Values	max. 0.12	max. 1.00	max. 0.02	max. 0.02	max. 0.50
	Al (%)	Cu(%)	Cr (%)	Ni (%)	N (%)
	max. 0.20	0.25-0.55	0.30-0.80	max. 0.30	max. 0.01

The presence of copper in the oxide layer contributes to the formation of a strongly bonded, elastic and compact patina on the surface of HC315WP in the course of the corrosion process. The chromium and nickel contribute to the formation of insoluble alkaline sulphates, which will seal the pores of the oxide layer, thereby protecting the metal from water and oxygen. Silicon, and to a lesser extent phosphorus, also has a favourable effect on corrosion resistance.

Weldability

HC315WP has excellent weldability with all the usual welding processes thanks to its low carbon content and fine grained structure.

Delivery program MEKA Steel

MEKA Steel offers a full range of weather resistant steels, in hot rolled and cold rolled conditions. Pls. feel free to ask our sales representatives for more details with respect to dimensions, delivery terms and price conditions.

Summary of available cold rolled flat products:

Dimensions	coils	sheet
Thickness	0.5 mm. - 3.0 mm,	
Width	Max. 1850 mm.	
Length	–	14.000 mm.