

COR-TEN A

Cold Rolled Weather Resistant Steel

Generally up to 3mm Thick

COR-TEN® A is a cold rolled weather resistant steel that protects itself. With anticorrosive properties that slow down corrosion, the range includes grades that are in many applications better than those of other structural steels.

This product is produced under licence from the United States Steel Corporation.

Applications: External claddings, containers, transportation tanks

Tolerances: The tolerances of cold rolled sheet steel products manufactured by Ruukki are in accordance with EN 10131:2006. Products are delivered with the normal tolerances.

Surface Quality & Finish

Surface quality: Minor surface defects and slight colouring are permitted for the COR-TEN A steel.

Surface finish: The surface finish is normal. The roughness value Ra is approximately 0.6–1.9 µm.

Properties - Weather resistance

The atmospheric corrosion resistance of weather resistant sheet and strip is based on the chemical composition of the Steel. As a result of alloying elements, a dense protective patina layer composed of corrosion products is formed on the surface of the COR-TEN A steel under the influence of weather conditions, which significantly slows down the rate of rusting.

The protective layer develops within 18-36 months under normal atmospheric conditions provided that the steel surface regularly becomes wet and dry. At first, the protective layer is reddish brown, but gains a darker hue with time. In an industrial atmosphere the patina is formed quicker and becomes darker in colour than in a rural atmosphere.

Thanks to the patina, unprotected COR-TEN A steel can be used in outdoor applications regularly exposed to changes in weather. However, the protective layer does not form if the steel surface is constantly wet.

COR-TEN A withstands corrosion caused by exhaust gases from sulphur containing fuels better than normal structural Steels. Resistance to scaling at high temperatures is also better.

Unusually high rates of corrosion may occur in chlorine containing or marine atmospheres. It is recommended that weather resistant steel is painted under such conditions.

Design Issues

In structures where the steel is not directly exposed to the atmosphere the patina may become less uniform. The surface layer may also become uneven in structures exposed to considerable local variations in temperature or when exposure to the elements is uneven in different parts of the structures, such as steel surfaces under eaves.

When using weather resistant steel, it is important that the design provides adequate ventilation on the reverse side of the sheet to avoid corrosion.

To ensure a uniform colour of the patina, any oil, mortar, paint marks or dirt must be removed from the surface. Any markings should be made with chalk or water soluble pigments. The use of acidic detergents should be avoided. Before the protective layer has developed, some rust from the surface will dissolve in rain water. The structures should therefore be designed so that the drain water will not discolour any objects underneath.

Mechanical Properties

	Yield strength R_e MP _a	Tensile strength R_m MP _a	Elongation A_{80} %
COR-TEN A	310	450	22

Tensile testing is carried out transverse to the rolling.

¹⁾ If the yield point is not pronounced, the values apply to the 0.2% proof strength $R_{p0.2}$. If the yield point is pronounced, the values apply to the lower yield point (R_{eL}).

Chemical Composition

Content %	C	Si	Mn	P	S	Cr	Cu	Ni	Al
Minimum		0.25	0.20	0.07		0.50	0.25		0.015
Maximum	0.12	0.75	0.50	0.15	0.03	1.25	0.55	0.65	0.060

Processing Instructions

Forming

The COR-TEN A steel can be cold formed in the same manner as general structural steels of the same strength. The minimum bending radius is 0.5 x t.

Welding

Weather resistant steel is well suited for welding by conventional methods. When using methods requiring welding consumables, the consumable can be selected for either its welding technique or aesthetic properties. In the latter case, the colour of the weld is designed to match with the colour of the plate to be welded. Recommendations for welding consumables can be obtained from manufacturers.

Content of the manual:

- Background and advice in choosing welding parameters
- Recommended welding parameters for both cold rolled un-coated sheets and metal coated sheets

Paint Coating

If required, the COR-TEN A steel can be painted by methods similar to those applicable to other cold rolled grades. Painting is recommended for applications where the formation of the patina may become obstructed.

Order & Delivery

Delivery condition

The products are delivered with a mineral oil based rust preventive applied to the surfaces, unless otherwise agreed in the order. If rusting is permitted during transport or storage, it is preferable to order the steel without protective oil to promote the formation of a uniform patina. Unprotected deliveries are at the customer's risk.

Inspection

Each basic coil is an inspection lot of its own. The maximum coil weight is 30 t. One tensile test (according to EN-ISO6892-1:2009) per inspection lot is carried out with transversal samples.

Inspection Documents

An inspection document of the required type (according to EN 10204) is provided when agreed in the order.

Full specification and details are available on request.
The above information is provided for guidance purposes only.
For specific design requirements please contact our technical sales staff.
