ArcelorMittal Europe – Long Products
Sections and Merchant Bars

ArcelorMittal

Arcorox®

Weathering steel according to EN10025-5 / ASTM A588

Arcorox® structural shapes belong to a family of atmospheric corrosion resistant, low alloy steels for sustainable applications with focus on long service life with low maintenance costs.

Advantages of Arcorox®

Arcorox® weathering steel members do not need corrosion protection. Therefore, along with aesthetic possibilities, Arcorox® provides durable construction even in the absence of initial painting, which enables in this case savings thanks to:

Office Building, Esch/Alzette (L)

- **Reduced construction cost** along with construction time;
- **Reduced cost of maintenance** as well as time of maintenance operation;
- **No environmental impact** due to absence of maintenance operations and residue.

Application of Arcorox®

The use of Arcorox® weathering steels may be motivated by architectural, decorative and environmental incentives and/or for robust industrial applications in particular with the aim to minimize maintenance for e.g. halls, bridges and towers.

Functionality of Arcorox®

Arcorox® weathering steel initially forms a natural, tightly adherent, protective oxide layer (patina), strongly reducing further oxidation and thus superseding the application of any corrosion protection system. The formation of the patina depends on the adequate environment the surface is exposed. For instance, the steel surface must be alternatively dry and wet, in order to built-up the protective layer.

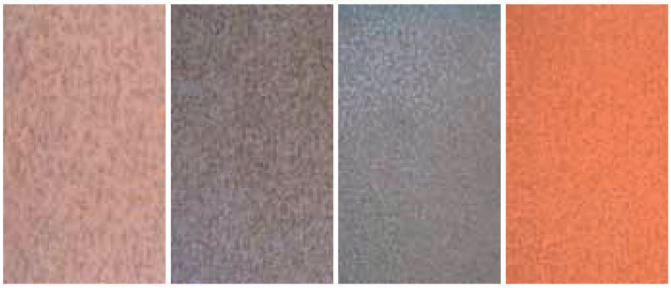
Aesthetic aspects

Appearance, texture and maturity of the patina depend on time, degree of exposure and atmospheric environment.

With time, the oxide coating changes from a rusty redorange to a dark brown (in some cases slightly purple) patina.

In industrial environments weathering steel usually achieves the darkest tone whereas in rural locations, the oxide coating develops more slowly, and generally has a lighter tone.

It is advisable to carry out sand blasting on surfaces exposed to atmospheric corrosion in order to obtain a regular patina and a uniform coloring, in particular if a uniform weathered appearance is desired as early as possible. With accumulation of contaminants or in case of physical damage it is recommended, that cleaning should be done after completion of constructional work.



Example of colors, for different exposure conditions

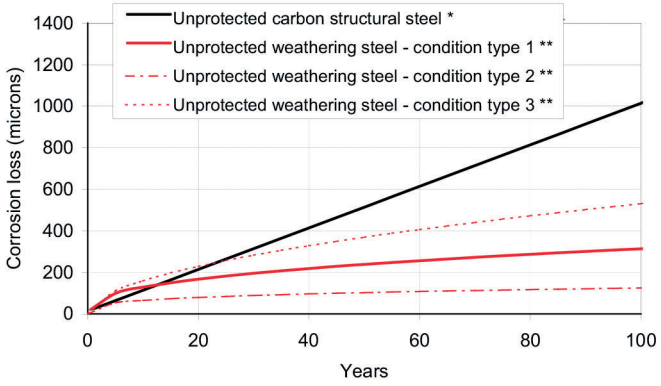
Design considerations

The design of weathering steel members is covered by Eurocode 3: Design of steel structures.

In addition it is recommended that suitable construction detailing is foreseen, such as to:

- Avoid rust staining of other materials;
- Avoid details that would promote retention of moisture.

Such constructive details are available in literature and on request.



* *Corrosion losses for carbon structural steel [EC3-5]*

** *Expected long term atmospheric corrosion losses according to G101-04 ASTM Standard Guide (based on results for 1: Columbus site; 2: Bethlehem site; 3: Pittsburgh site*

Joining

Connection elements like bolts, screws, nuts, washers, should have an atmospheric resistance equal to or higher than the weathering steel.

The formation of a local electrochemical element (contact corrosion) must be avoided in any case.

In the case of bolted joints an anti-corrosive painting of the contact surface is recommended. In addition a sealing of the joint might be necessary in order to prevent water infiltration.

Welding

Arcorox® can be welded with all manual and automatic welding processes according to the general rules for welding.

The weld metal should be adapted to the mechanical properties of the base metal. The atmospheric corrosion resistance of the weld metal should be equal or better than that of the steel (in case of multiple passes there is no need for the submerged runs to have such a resistance).

Limitations

Despite, that most sites are suitable for the use of weathering steels, in some cases the self protecting patina may be ineffective:

- In atmospheres containing concentrated, corrosive industrial or chemical fumes (at an extreme level, which is rarely encountered);
- In locations subjected to salt-water spray or salt-laden fog (including marine environment);
- When deicing salt leads to substantial deposits of chloride on the steel;
- In applications where the steel is continuously submerged in water, buried in soil, or more generally, warm and damp sites (because of absence of wet / dry cycles);
- In places where the protective layer is repeatedly removed by physical contact.

Available sections (EN 10025-5: 2019)

S355J0W / S355J2W / S355K2W
S460J0W / S460J2W / S460K2W

- Parallel flange I sections IPE (or UB)
- Wide flange beams HE (100-1000)
- Extra wide flange beams HL
- Wide flange columns HD (or UC)
- Wide flange bearing piles HP (or UBP)
- Channels with parallel flanges UPE (or PFC)
- European standard channels UPN (or CH)
- Equal and unequal leg angles L

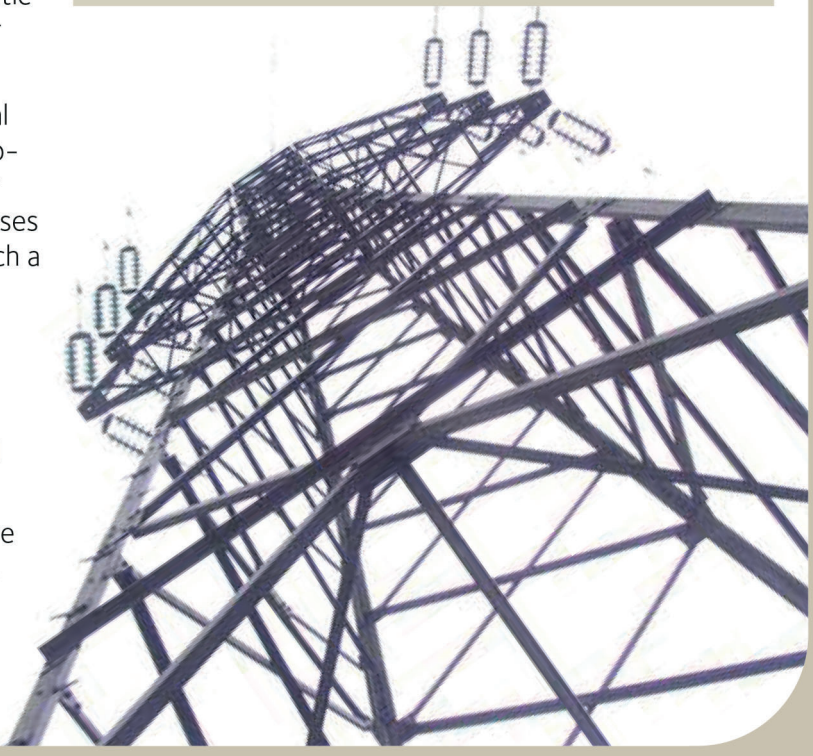
ASTM A588 grade B

- Wide flange beams W; Wide flange bearing piles HP

All sections are limited to flange thicknesses ≤ 63 mm, except 70mm for W14x16 and W 36x16.5.

Minimum order quantity is subject to agreement.

Further information and a detailed list of available sections are given at *sections.arcelormittal.com*



Contacts

ArcelorMittal Commercial Sections
66, rue de Luxembourg
L-4221 Esch-sur-Alzette
Grand-Duchy of Luxembourg

Tel: +352 5313 3010
sections.tecom@arcelormittal.com

version 2021-1