

## Weather-resistant steel

Weather-resistant steels of Cor-Ten type have excellent weldability. All welding methods can be used when proper precautions are taken. In general, matching filler metals should be used. For dissimilar joining i.e. weather-resistant steel grades of different strength under matching filler metals can be used, in such cases we recommend that you contact us for information.

When welding weather-resistant steels it is important to minimize the risk of cold cracking (also known as hydrogen cracking or delayed cracking). Hydrogen in weld metal combined to stresses in the welded structure is the main reason for such cracking. The risk of cracking can be minimized by:

- preheating the base materials before welding
- ensuring that the joint surfaces are perfectly clean and dry
- minimizing the shrinkage stresses
- use a low hydrogen filler metal ( $H_{DM} < 5 \text{ ml} / 100 \text{ gr. deposit weld metal}$ )

## Creep resisting steel

Such steels are used for the creep resistance in medium-high to high temperature applications. Depending on the temperature for which they are intended, both base material and filler metals should guarantee strength properties at their respective working temperature. For exact welding recommendations, we advise you to contact us.

In general, low alloyed creep resisting steels are excellently weldable. Before, during and after welding special precautions should be taken on heat-treatment (preheating), interpass temperatures and post-weld heat-treatment (PWHT).

For more details, we recommend that you contact us for information about the exact treatment for your application. In such a case, please specify the base materials used and provide us with as much specific information as possible.

## High strength steel

Low alloyed high strength steels offer users the possibility of reducing the dead weight of a construction and so increasing the possibilities of the same. Steels of this kind are widely used for pressure vessels, mobile cranes, lifting equipment, vehicle frames etc.

Low alloyed high strength steels owe their strength to their lowest possible alloying content and to their specific production process. As a result, they can be welded easily when special precautions are taken. After welding it is important that the steel structure has maintained its specific microstructure giving the steel its high strength and toughness. It is therefore of utmost importance to pay special attention to shear cutting, machining, forming, cold bending, folding as well as thermal cutting and welding. The welding process may cause a change in the steel's microstructure. If not done properly the base materials will lose their strength.

Take special and extra precautions when welding low alloyed high strength steels:

- ensure that the joint surfaces are perfectly clean and dry
- minimize the shrinkage stresses
- use the lowest heat input possible
- use a low hydrogen filler metal ( $H_{DM} < 5 \text{ ml} / 100 \text{ gr. deposit weld metal}$ )
- follow the PWHT recommendations of your filler metal supplier, post-heat the welded joint immediately after welding, the PWHT temperature should be the same as the preheat temperature.

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