

COLD CRACKING

One of the most common and catastrophic defects that can occur during welding of ferritic steel is cold cracking (also known as hydrogen cracking or delayed cracking). The cracks may occur in the weld or, more typically, in the heat affected zone, and can start at any time ranging from a few seconds to several days after solidification of the weld metal.

The most important factors that influence cold cracking are:

- Hydrogen content of weld metal
- Transformation characteristic of the weld metal and parent
- Residual stress
- Thermal cycle and cooling rate

Occurrence of this defect can easily be prevented by selection of the correct welding procedure.

Determination of Carbon Equivalent

$$CE = C + \frac{Mn}{6} + Cr + \frac{Mo}{5} + V + Ni + \frac{Cu}{15}$$

The higher the CE the harder the microstructure and the greater like likelihood of cold cracking.

Please note: These are very generic points. Type of Crack and its mechanism is dependent on a very large number of factors, and must be discussed on a case-to-case basis, taking into consideration the specifics.