

Different Types of Corrosion

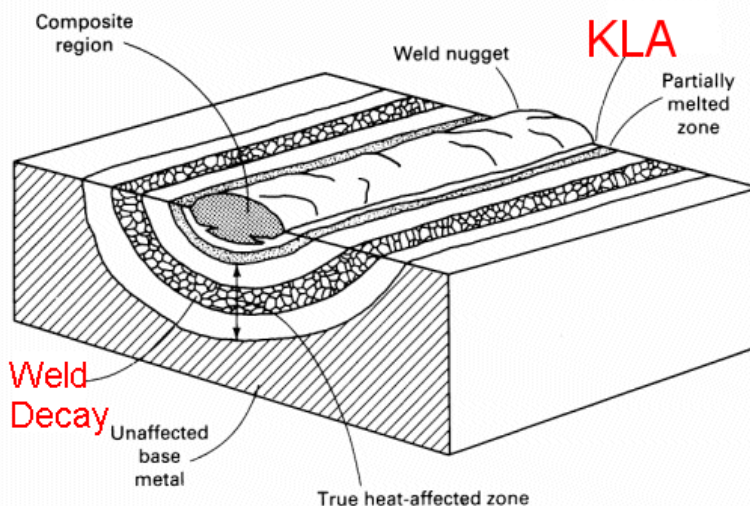
- Recognition, Mechanisms & Prevention

Intergranular Corrosion: Knife-Line Attack (KLA)

Recognition of Knife-Line Attack

What is knife-line attack? Knife-Line Attack (KLA) is a form of intergranular corrosion of an alloy, usually stabilized stainless steel, along a line adjoining or in contact with a weld after heating into the sensitization temperature range.

The corrosive attack is restricted to extremely narrow line adjoining the fusion line. Attack appears razor-sharp (and hence the name of "knife-line" attack). It is possible to visually recognize knife-line attack if the lines are already formed along the weld.



Mechanisms of Knife-Line Attack

What causes knife-line attack?

For stabilized stainless steels and alloys, carbon is bonded with stabilizers (Ti or Nb) and no weld decay occurs in the heat affected zone during welding. In the event of a subsequent heat treatment or welding, however, precipitation of chromium carbide is possible and this leaves the narrow band adjacent to the fusion line susceptible to intergranular corrosion.

Prevention of Knife-Line Attack

How to prevent knife-line attack? Knife-Line Attack can be prevented through:

- Heat treatment - heating the weld to 1065°C to re-stabilize the material.

For more details on Knife-Line Attack

Where can I learn more about knife-line attack? More details on knife-line attack and weldment corrosion are included in the following corrosion courses which you can take as in-house training courses, course-on-demand, online courses or distance learning courses:

Corrosion and Its Prevention (5-day module)

API 571 Damage Mechanisms Affecting Fixed Equipment in the Refining and Petrochemical Industries (5 days)

Corrosion Inspection, Testing and Monitoring: Techniques and Applications (5)

Corrosion, Metallurgy, Failure Analysis and Prevention (5 days)

Marine Corrosion, Causes and Prevention (2 days)

Materials Selection and Corrosion (5 days)

Stainless Steels and Alloys: Why They Resist Corrosion and How They Fail (2 days)

If you require corrosion expert witness or corrosion consulting service on knife-line attack, our NACE certified Corrosion Specialist is able to help. Contact us for a quote.
