

The Galvalloy substrate and the Confidex guarantee



Colorcoat HPS200 on Galvalloy substrate

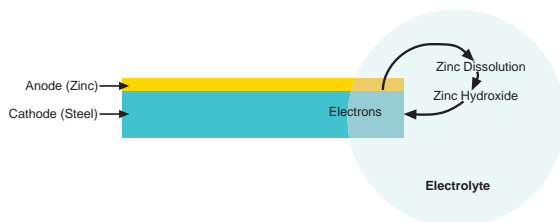
Generic plastisol on HDG substrate

This photograph comparing Colorcoat HPS200 on a Galvalloy substrate with a generic plastisol on HDG after 1000 hours accelerated corrosion testing in an aggressive salt-laden environment illustrates the cut-edge benefits of Galvalloy.

To understand the effectiveness of Galvalloy, it is important to understand the process of sacrificial protection:

Sacrificial protection involves a coating, traditionally zinc, which is applied to steel, sacrificing itself to corrosion instead of the steel base. But to get to that state of affairs requires an electrochemical process, and the cell which causes this process has three essential constituents:

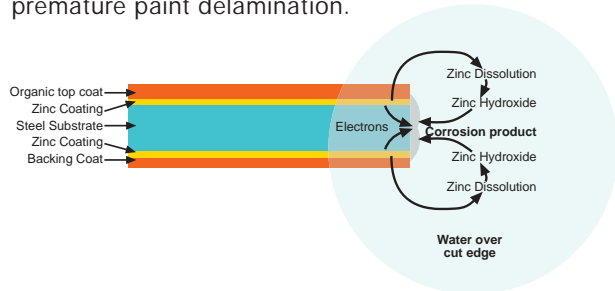
- **An anode** – a metal with a high chemical activity, such as zinc or zinc-aluminium alloy. This forms the site where the corrosion happens.
- **A cathode** – a metal with a lower chemical reactivity, such as steel.
- **An electrically conducting solution** – the corrosive medium, such as rainwater.



Schematic diagram illustrating the electrochemical process of corrosion

At the anode (zinc) the metal is ionised and released into the electrolyte solution, with electrons flowing through the metal interface to the cathode. The minute electric current which is generated prevents the cathode (the steel) from reacting with the electrolyte (rainwater). In this way, metal dissolution (corrosion) at the cathode is prevented and this is referred to as sacrificial or galvanic protection.

With conventional zinc coatings, sacrificial corrosion of zinc to protect the steel base at exposed edges can leave a small section of the paint layer at the edge unbonded which can on occasions contribute to premature paint delamination.



Schematic diagram illustrating corrosion at cut edges

The Galvalloy substrate is different from conventional zinc coatings. The eutectic alloy of 95% zinc and 5% aluminium in the metallic coating of Galvalloy is optimised to give a very fine micro-structure. Sacrificial protection occurs through the dissolution of the zinc-rich portions, but the presence of the aluminium-rich areas, which don't react in the same way, prevents excessive reaction, maintains the integrity of the metallic coating and therefore minimises the cut-away of the metallic coating layer. In this way, adhesion of the organic coating layer at cut edges is maximised without compromising the sacrificial protection afforded by the metallic coating.



This micrograph of the Galvalloy coating shows the distribution of aluminium and zinc-rich phases.