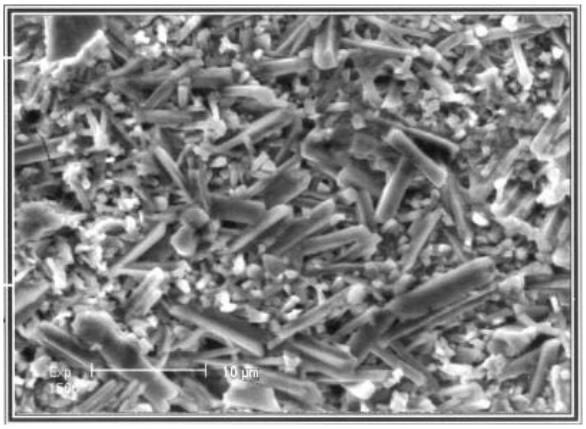
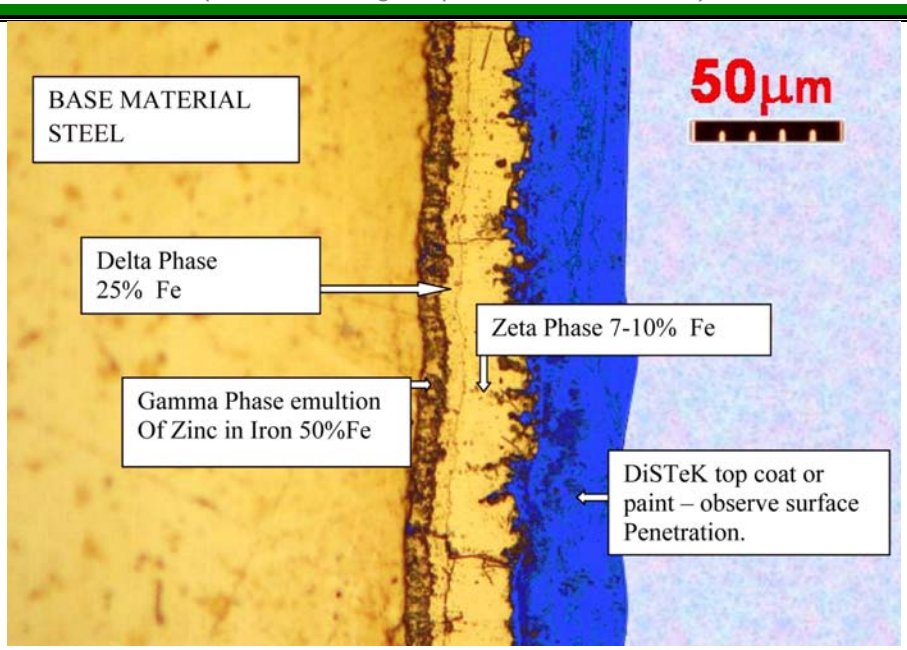
ArmorPLEX™ WHY IT WORKS BEST

Let me start by saying that **ArmorGalv®** is NOT zinc. It is, in fact, layers (phases) of zinc/iron alloy. The automotive industry has been using a form of this type of "galvanizing" for body sheet metal that will be painted. It is known as "Galvanneal", which results in better paint adhesion and corrosion resistance. **ArmorGalv®**'s surface is not smooth like that of bright electroplated zinc, but is rather "geographic". This is demonstrated in the following photo:

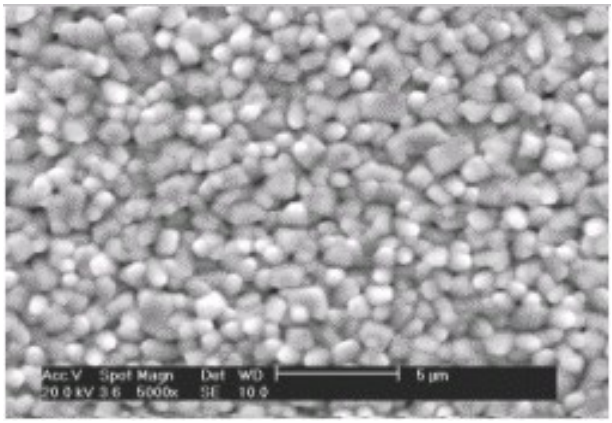


This surface results in superior adhesion of Xylan (or any topcoat) to the surface. This is why **Bodycote, Int'l** of England uses **ArmorGalv®** as a base for Xylan that is used in offshore oil well applications for **BP** , and other topcoats under the tradename of "**Sheraplex**". When **ArmorGalv®** is followed by a paint, it is designated as ArmorPLEX™.



Armor**PLEX™**

Bright electroplated zinc, on the other hand, is smooth, and requires chromating and primers to exhibit good adhesion properties with topcoats, as is shown below:



Bright Zinc Electroplate/5000X magnification

Hot Dip Galvanize is even more difficult to paint with good adhesion.

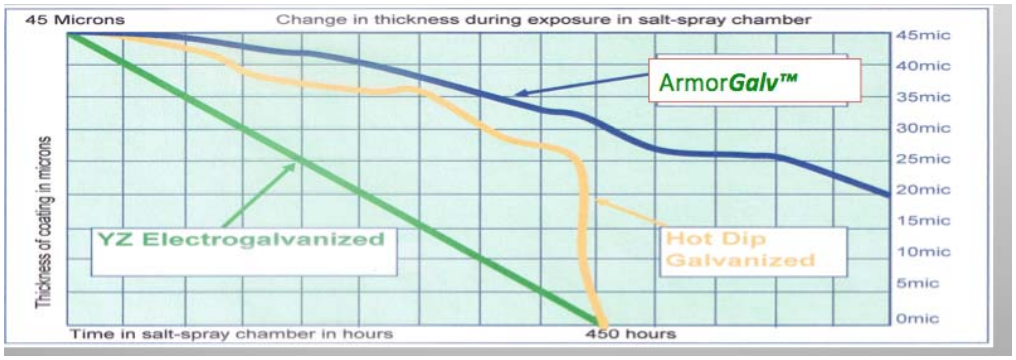
ArmorGalv® Compared to Hot Dip Galvanize and Electro-galvanize

Electro-galvanized coatings are, essentially, pure zinc (Eta phase) all the way through to the substrate. Therefore, when it is subjected to a corrosive environment it corrodes at a uniform rate.

Hot Dip Galvanize is pure zinc on the surface, but forms slight amounts of zinc/iron phases as it approaches the iron base. The reason for this is that under heat iron is soluble in zinc. Since Hot Dip is done under heat, there is some alloying which takes effect. This raises the corrosion protection in relation to electroplated zinc, because zinc/iron is *more* corrosion resistant than is pure zinc. ("Galvanneal", which is used to coat sheet metal for painted automobile bodies, is **flash** heated after coating to increase the zinc/iron phases and to eliminate the pure zinc on the surface, which results in superior paint adhesion).

ArmorGalv® is subjected to heat for a much longer period of time than is Hot Dip or even Galvanneal. Therefore, there are thicker layers of zinc iron alloy phases, with no pure zinc on the surface. This makes **ArmorGalv®** more corrosion resistant, thickness for thickness, than any other zinc coating process. This can be seen in the following chart.

The **ArmorGalv®** line begins to flatten out, because as the coating corrodes, it reveals an even more corrosion resistant layer underneath.



Notice that the electro-galvanized line is straight – that's because it is the same zinc exposed to Salt Spray, so it corrodes at a linear (uniform) rate.

THE CASE OF CADMIUM

The corrosion resistance of cadmium is higher than that of zinc. It has long been known among electroplaters that there is a **"3 to 5 Rule"** for cadmium versus zinc:

"0.0003" Cadmium is equivalent to 0.0005" Zinc in corrosion protection".

This, however, is not the entire story. Cadmium is also **non-galling**. When cadmium plated bolts corrode they can still be unscrewed. Zinc, on the other hand, will seize up and must be cut or torched for removal.

ArmorGalv® exhibits the same anti-galling properties as does cadmium and is even **more** corrosion resistant.

If you go to Chem-Plates website:
HTTP://WWW.chemplateindustries.com and follow the **ArmorGalv**® links you will see two videos that demonstrate **ArmorGalv**®'s ability to be unscrewed even after being subjected to 1,000 hours of salt spray!

In conclusion, **ArmorGalv**® is more corrosion resistant than any other form of galvanizing, has better adhesion to Xylan and other topcoats and is a viable alternative to cadmium, including for stainless steel (any alloy) parts that need an anti-galling coating.

Martin Straus