

"Zincalume" versus hot dip galvanizing

The zinc / aluminium coating as applied to continuously coated steel sheet provides excellent corrosion resistance in the case of atmospheric exposure in most environments. The same does not of course pertain in buried or immersed conditions where the corrosion mechanism of selective leaching can significantly influence the corrosion resistant life of this coating. For atmospheric exposure, the claim is made that "Zincalume" will provide a lifetime of up to four times that of hot dip galvanized steel under the same conditions. This claim is no doubt correct when it comes to comparing normal continuously hot dip galvanized steel e.g. roof sheeting with material onto which the Zn/Al coating has been applied by means of a similar process.

The bland statement that "Zincalume" steel has a lifetime of up to four times that of hot dip galvanized steel is, however, nebulous and, hence, misleading since it does not define coating thickness or for that matter the difference in coating structure obtained from the hot dip galvanized coating applied after fabrication to that obtained on continuously hot dip galvanized coil. The following technical information is given with a view to providing a transparent and unbiased picture.

Continuously hot dip galvanized steel coil (Zendimir Process). The zinc coating applied on this material in general use is referred to as Z275 i.e. 275g/m² of zinc or more accurately 137.5g/m² per side. Converted into coating thickness, this yields an average thickness between 18 and 20 microns per side of a relatively pure zinc coating where iron/zinc alloys are virtually absent.

Furthermore, the specification makes allowances for only 40% of the individual value (235g/m²) i.e. 13.5µm to be found on one side.

The claim that a "Zincalume" coating will provide up to four times the life of this coating in atmospheric exposure is probably correct from a barrier protection aspect.

General Hot Dip Galvanizing after Fabrication

This process provides a coating thickness of 60 to 80 microns on relatively thin steel sections such as that used for the manufacture of palisade fencing. Added to this, the coating structure consists of between 50% and about 80% iron/zinc alloys, which provide 30% greater corrosion resistance in most environments than

that available from pure zinc.

Apart from the added protection provided by the iron/zinc alloys, it must be borne in mind that this coating is some 5 times thicker than that provided by the "Zincalume" coating.

For these reasons, the claim that a life of four times greater is obtainable from "Zincalume" is most certainly not applicable to hot dip galvanizing as applied by the general hot dip galvanizing process.

Other Factors that need to be considered

Formability:

The Zinc Aluminium coating is more prone to damage and cracking than a pure zinc coating, particularly where thicker steel sections are involved. This can result in micro cracking of the coating when severe bending or forming takes place.

Edge Protection:

The cathodic protection provided by the hot dip galvanizing processes is substantially more effective than that available from the Zinc Aluminium coating. Steel sections in excess of 0.6mm thickness will display distinct rust staining on cropped edges. In the case of the general hot dip galvanizing process, such problems do not apply in that all surfaces are provided with a protective coating.

Summary:

The zinc / aluminium coating (Zincalume) is an excellent coating in most environments when used, for example, as roof sheeting. To claim that its protective properties are superior to the substantially thicker and metallurgically different hot dip galvanized coating applied to fabricated products would be both misleading and irresponsible.



The edge protection properties provided by a zinc / aluminium coating are substantially less than that provided by a hot dip galvanized coating.