

Zinc Nickel



Widely used by industry in general, and automotive manufacturers in particular, zinc nickel gives sacrificial protection to the underlying iron or steel, that is the zinc corrodes in preference to the substrate. This has the additional benefit that steel exposed at cut or abraded areas will not easily rust.

This coating can be produced from acid or alkali solutions, the most popular now becoming the alkali as it is easier to control, is more ductile, gives a more consistent alloy and more even thickness than the acid solution.

The alkaline solution used gives nickel content of 12-15%. It has been shown that this range of concentrated nickel gives better corrosion performance than other solutions. This type of solution is used by the Anochrome Group.

The Group is a major supplier of barrel and rack plated parts in this finish. The ELV (End of Live Vehicle) Directive has also affected this finish such that hexavalent passivates are declining in use and are being replaced by trivalent passivates or organic top coats for black finishes.

Zinc-nickel (12-15% nickel) 8 µm thickness. Neutral salt spray performance:

Passivate Coating	Salt Spray (hrs)		
	Cr6+	White Rust	Red Rust
Black Chromate	Free	240	720
Clear Trivalent	Free	120	720
Heavy Trivalent	Free	240	720
Blk Chromate + top coat	Free	240	1200

The coating is suitable for parts that are formed or crimped after plating, the zinc nickel giving good corrosion protection (sacrificial) even if forming is severe enough to cause cracking of the deposit.

The zinc-nickel coating, with passivate, has better heat resistance than other passivate coatings, giving no real reduction in protection even after heating to 120°C. This ensures that use in engine bays and in contact with hot oil does not reduce corrosion resistance.

When a silver coating is required, enhanced corrosion resistance can be obtained by using the seals or lacquers.

The zinc nickel solution used has the following advantages over zinc electro plating.

1. Higher corrosion resistance (at least double that for the same thickness).
2. Good temperature stability. Not significantly affected by temperatures of 120°C.
3. Good ductility and also good sacrificial protection if cracks in the coating occur due to excessive metal movement.



The coating is specifically useful for:

- a) Fine threads.
- b) Hose ends, etc. that are crimped after electro plating.
- c) Pipe brackets that are reformed after electro plating.
- d) It has been proved to be good in contact with aluminium and is used as a cadmium replacement in many applications.

The coating is a matt silver in colour when supplied with a trivalent clear passivate, or a iridescent blue/yellow when supplied with a heavyweight passivate. Zinc nickel with a black passivate is not normally a deep pure black colour and can be enhanced by the addition of an organic top coat.

Many automobile companies specify zinc nickel, such as:- Toyota, Opel, Audi VW, Honda, BMW, Nissan, Ford, JLR.

Both zinc nickel barrel and vat plating offer black passivate and trivalent passivate to satisfy a number of specifications.

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