METAL COLOURS

ZINC - NICKEL ALLOY PLATING SERVICES

Why High Nickel-Zinc Alloy?

Metal Colours was the first sub-contract surface treatment company in the UK to offer zinc-nickel alloy plating in fully automated production facilities.

Metal Colours is now able to offer a new generation high nickel in both rack and barrel applications, containing alloy that provides an even higher level of corrosion protection, particularly under the arduous thermal conditions present within automotive engine compartments. This development maintains Metal Colours at the forefront of advanced technology designed to meet the most stringent requirements of the automotive industry.

The new alloy contains 12-15% nickel. Apart from the enhanced corrosion protection, there is an absence of the voluminous white corrosion products typical of conventional and low alloy zinc deposits. This reduces the risk of threaded fasteners seizing after long use. Other advantages of the new alloy include improved metal deposition in low current density areas of the component, a bright appearance, excellent surface hardness, and high wear resistance.

The high nickel alloy may be post-treated with iridescent yellow or clear passivates, and for the first time, a high quality colour fast black finish. Other post treatments are available for specific requirements such as enhanced corrosion protection and high torque lubricity.

High zinc-nickel alloy plated parts are already in use by the leading motor vehicle manufacturers in Europe, including Rolls Royce, BMW, General Motors, Rover, Ford, Toyota and Honda.

CORROSION PROTECTION OF ZINC-NICKEL ALLOY

The only two widely used quality control procedures for the evaluation of zinc-nickel alloy are the neutral salt spray test, and the combined cyclic corrosion test. The latter test is designed to reproduce the varying changes of temperature, humidity and salt spray that occur within automotive engine compartments and other critical areas. Both tests assess corrosion protection to the onset of substrate corrosion-red rust, and the resistance to corrosion of the coating itself-white rust.

Plated zinc-nickel alloy deposits are invariably passivated with a yellow, clear or black finish. These passivates, apart from their cosmetic value, have a powerful effect on delaying the onset of white corrosion.

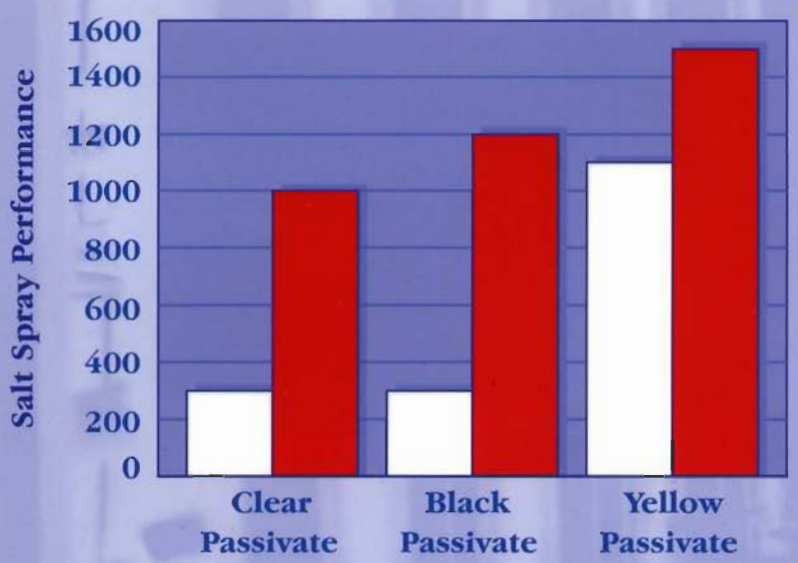
As with all types of zinc coatings, corrosion protection is a function of the thickness of the deposit.

Corrosion Protection

Neutral Salt Spray - hours to red rust		
Passivate type	Conventional zinc	High Nickel Alloy zinc
Clear	100 (6-24)	900 (240)
Iridescent Yellow	150-200 (72-96)	1500+ (1000)
Black	120-150 (72-96)	1500+ (500)

( ) = white corrosion

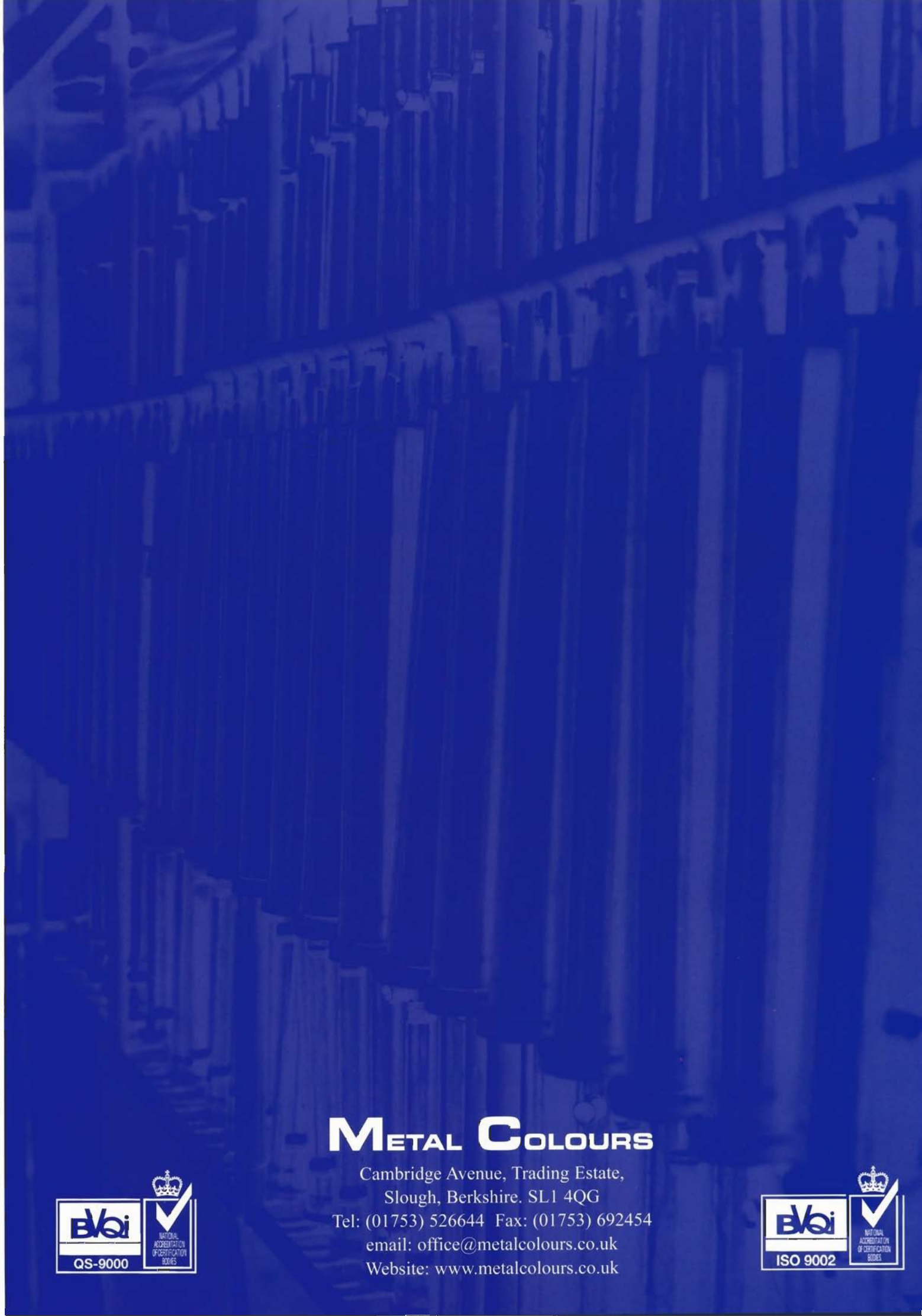
Properties	Conventional Zinc	High Nickel Zinc Alloy	Standard Zinc Alloy
Nickel %	Nil	12-15	5-8
Vickers hardness (100g)	90 - 130	400 - 500	200-250
Weldability	Poor	Good	Good
Thermal stability	Poor	Excellent	Good



CORROSION PROTECTION OF BAKED DEPOSIT

ASTM B117 5% neutral salt spray test - 5µm deposit

Whilst most mild steels used for motor vehicle pressings and other components can be satisfactorily plated with high zinc-nickel alloys, there are some low grade steels which may not be suitable. The Metal Colours Technical Centre is able to process sample steels and offer technical advice.



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