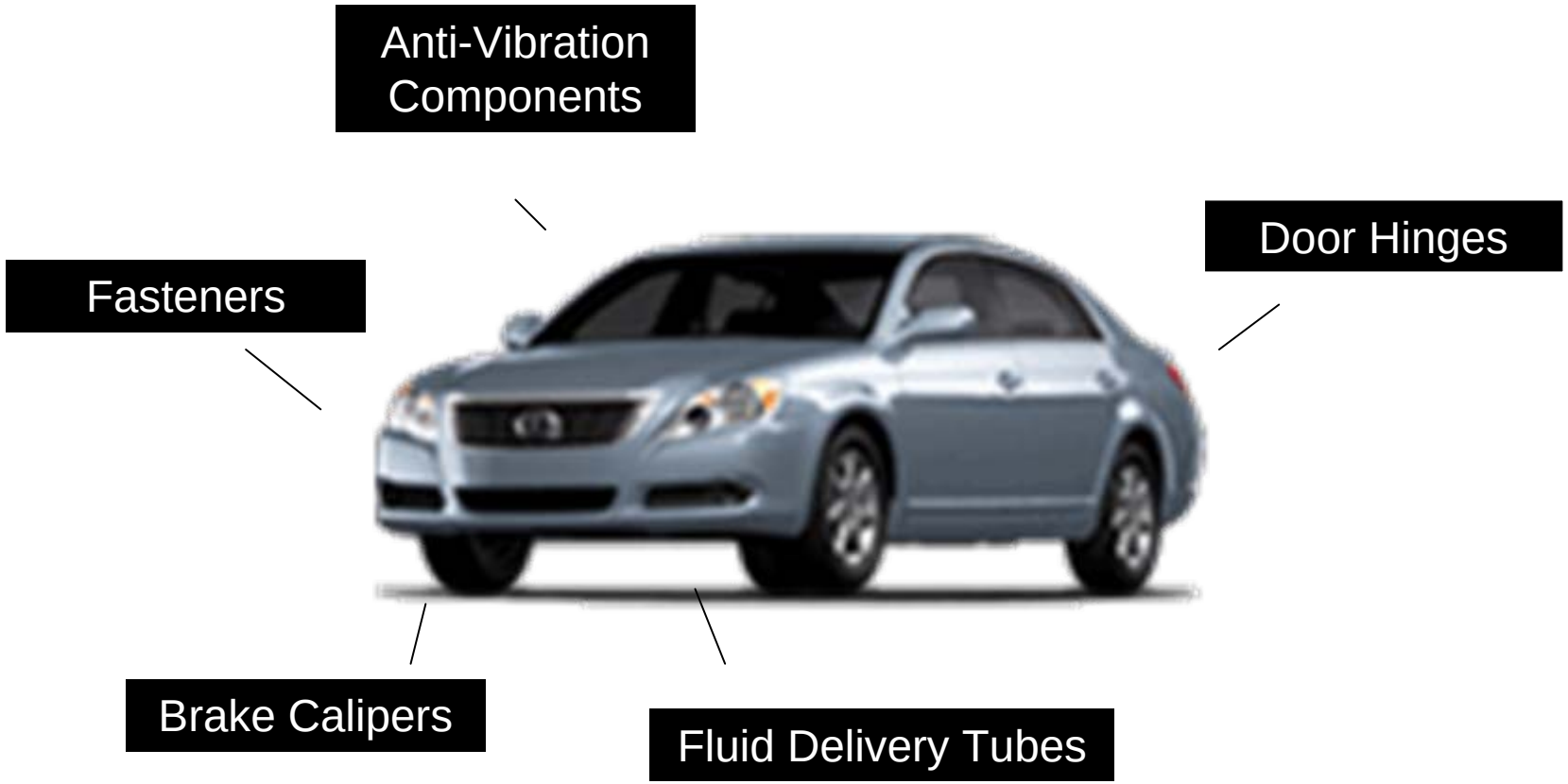
Performa 285

High Alloy Zinc Nickel

The Friendly Expertise

Alloy Zinc Automotive Applications



Alkaline Zinc/Nickel (12-15%)

Alkaline Zinc/Nickel (12-15%) Process Advantages

- *Alkaline Electrolyte*
- *Conventional Alkaline Zinc Equipment*
- *Uniformity of Deposit Thickness*
- *Improved Deposit Ductility*
- *Avoid Residual Solution Rusting Problem*
- *Membrane Anode Technology Available*
- *Cathode Efficiency Almost Equal to Acid*
- *Carbonate Build-up Minimized*

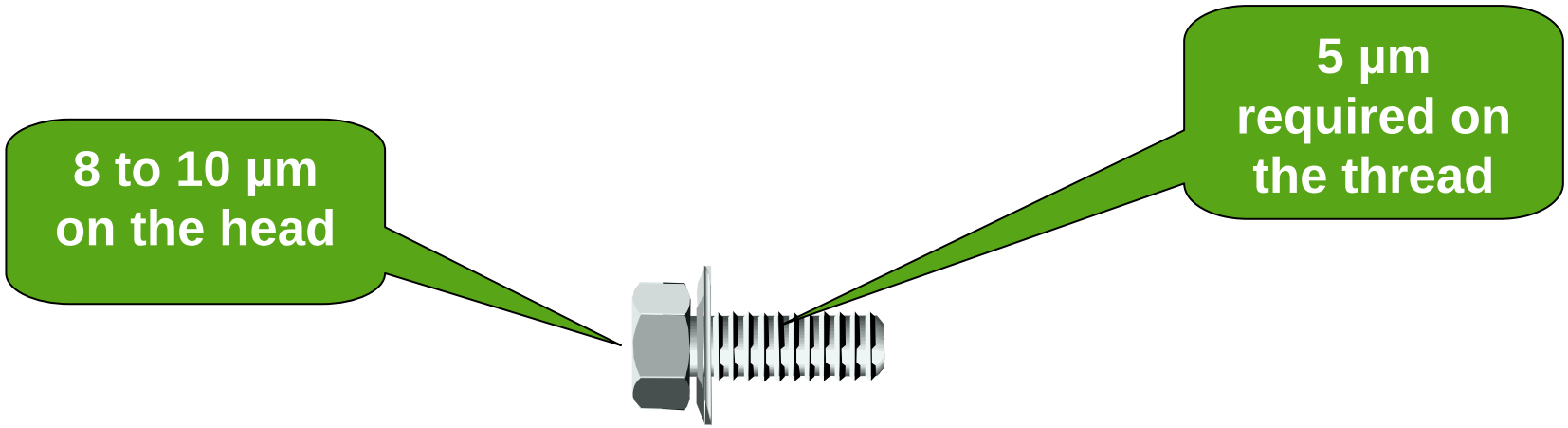
Alkaline Zinc/Nickel (12-15%) Deposit Advantages

- *Exceptional Corrosion Resistance*
- *Uniform Plating Thickness*
- *Uniform Alloy Distribution*
- *Deposit Can Be Bright*
- *Increased Deposit Hardness*
- *Clear & Black Trivalent Passivates*

Alkaline Zinc/Nickel (12-15%) Deposit Advantages

Metal Distribution (Fasteners)

- Alkaline process achieves greater plate thickness in threads and under washers – Better Plate Distribution.
- The Trivalent Passivate layer can dissolve 1-3 µm of deposit. With acid process it is difficult to achieve superior corrosion protection in these Low Current Density areas.



Alkaline Zinc/Nickel (12-15%)

Electrolyte	*Sodium Hydroxide*
Minimum thickness	*8 microns (0.0003”)*
Corrosion Resistance	*240-480 + hrs to WR* *1200 + hrs to RR*
Passivation	*Clear & Black*
Anodes	*Steel/membrane baskets*
Cathode Efficiency	*Steel: 50-60% /* *Membranes: 80-90%*

Coventya & Jasco
Trivalent Passivates for Zn Ni

Trivalent Clear

Jasco TRN-988 (12-15%)

Finidip 128 (12-15%)

Trivalent Black

Jasco 5W115

Finidip 728.2

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Why Choose Performa 285 Zn Ni?

- *Superior WR & RR Corrosion Protection*
- *Increased Wear Resistance*
- *Reduced Risk of Hydrogen Embrittlement*
- *Low Contact Corrosion w/ Aluminum*
- *Excellent Temperature Stability*
- *Excellent Plating Speed (Efficiency)*
- *Chemical Supplier Expertise & Support*

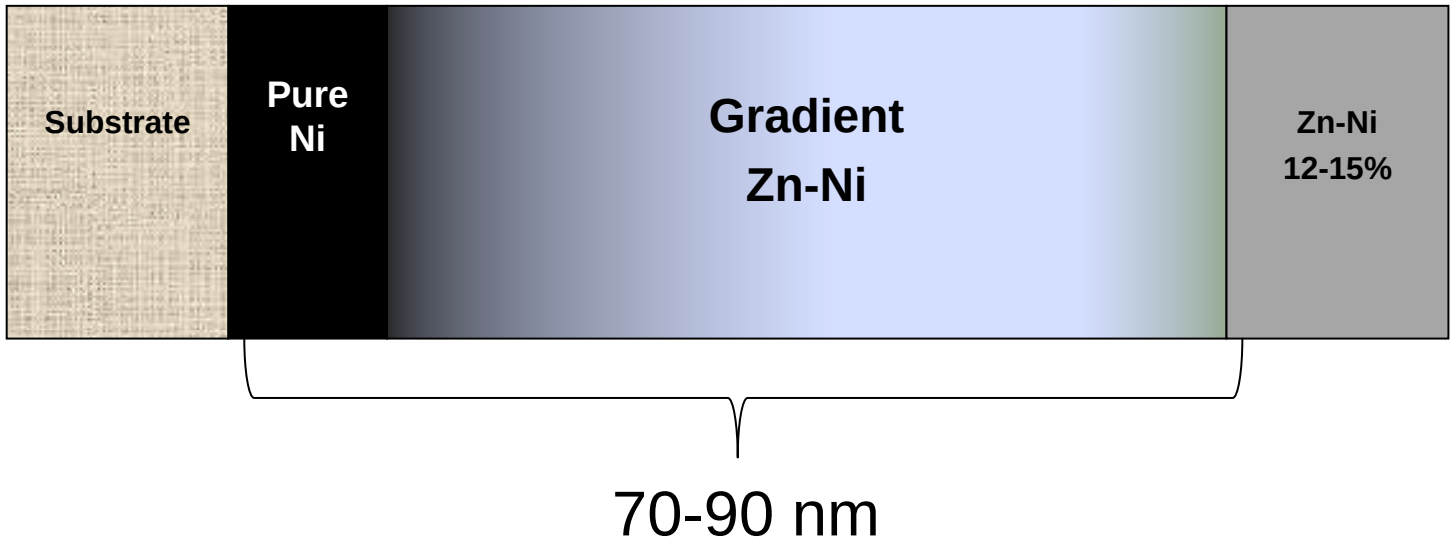
Performa 285 High Zn Ni (12-15%)

- ***Corrosion Protection (Technical Detail)***

  - Gamma phase (V_{SCE}) corrosion potential

    12-15% Zn/Ni as a real alloy (y phase) has anodic potential close to Cadmium

Potential moves slowly & becomes more noble closer to substrate

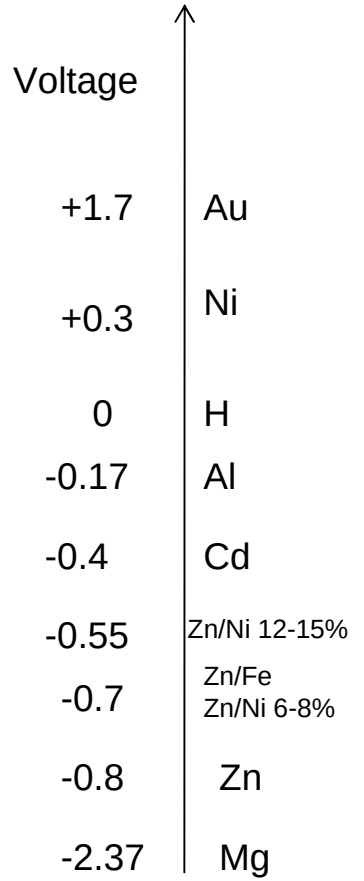


Performa 285 High Zn Ni (12-15%)

- ***Corrosion Protection (Technical Detail)***

  - The low difference of potential between Zn/Ni 12-15% and Al alloys or steels reduces the current and slows down galvanic corrosion of assembled components.

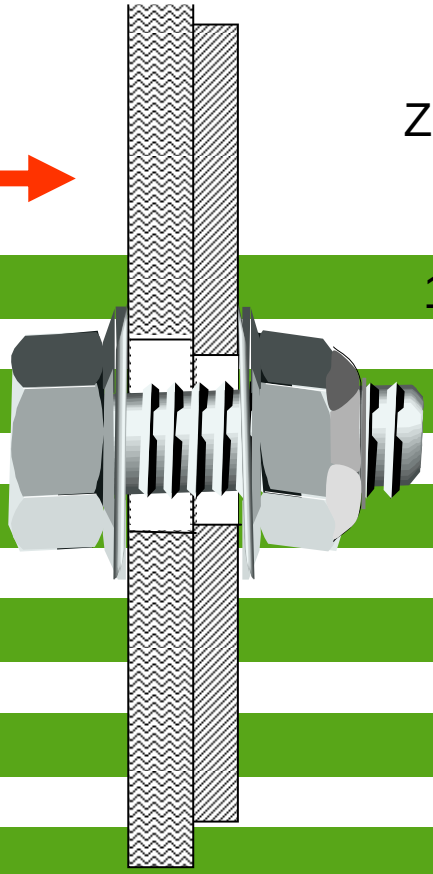
The increased use of Al in automotive applications makes Performa 285 12-15% Zn/Ni the alloy of choice!



Potential compared to standard hydrogen electrode (SHE)

High Zn Ni - Coupling with Metals

*Galvanic Contact : Potential Differences**



Coupled Metal →		Zinc	Zinc Nickel 12-15%
Stainless	Z 10 Cr Ni 18-9	1270	970
Brass	Cu Zn 39 Pb	760	460
Tin		600	300
Al 2017	Al Cu 4 Mg	460	160
Cast Iron		460	150
Steel	XC 10	400	100
Al 2011	Al Cu 5 Pb Bi	400	100
Al 6060	Al Si 10 Mg	335	35
Steel XC 80	XC 90 with HT	305	5
Al 5754	Al Mg 3	300	0
7049	Al Zn 8 Mg Cu	175	-125
Magnesium		-660	-860

*According NF E25-032 in NaCl 2% in mV

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Performa 285 High Zn Ni (12-15%)

- ***Increased Wear Resistance & Hardness***
  - Legrand Replaced Carbo-nitrited Steel with Performa 285
  - Parts Pass Renault D 24-1702-H (2x500g) Stone Blast Test After 1,056 hrs of NSST & 1hr at 120˚C

Plating bath	Nickel deposition	Vickers hardness (Hv)
Zinc (Z)	-	90 ~ 120
Low Zinc Nickel (Alkaline)	7%	200 ~ 250
High Zinc Nickel (Alkaline)	14%	330 ~ 430

Performa 285 High Zn Ni (12-15%)

Reduced Risk of Hydrogen Embrittlement

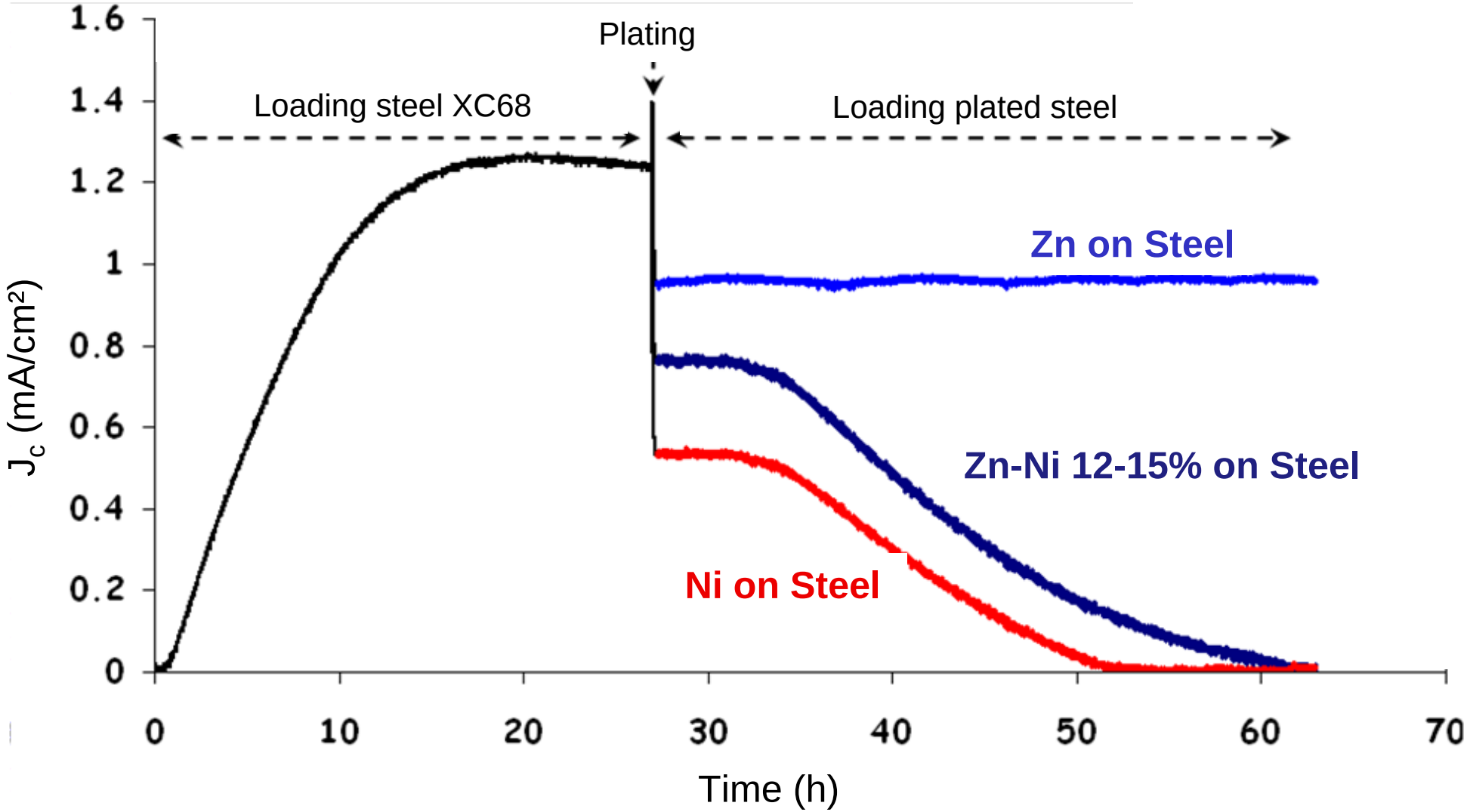
November 2007:
PhD study supported and financed by LISI-Automotive & Coventya

High Zinc Nickel Alloy does NOT Allow Permeation of Hydrogen Due to the Pure Ni Layer. (Lower Ni Alloy Allows Permeation – Next Slide)

Applicator Must Control Pre-Treatment & use inhibitor in pickle

Zn Ni Permeation Study :

Results:



Why Choose Coventya/Jasco for Zn Ni?

- *Proven Performance*
- *Global Availability*
- *Market Leading Technology*
- *Innovative, Patented Technology*
- *Superior Laboratory Technical Support*
- *Superior Field Service Support*

3S/PMS Performa Membrane System

- Protected by Patent EP 1292724 - December ‘05 (PMS) & EP 1702090 - September ‘07 (3S)
- Prevents Secondary Reaction at the Anode by Isolating Anode from Cathode
- Ensures Consistent Quality Plating Without Break-down Products
- Allows for Consistent Productivity & Efficiency

Thank you for your time and attention!