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# Electrodeposition and its protective mechanisms for surface preventive application

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The impact of electrodeposition keeps gaining wider coverage due to its surface enhancing properties and excellent performance among other coating technologies. However, the challenge regarding coating stability and efficiency has been seen to be based on the process parameter and coating mechanism. This overview established the

contemporary materials for major deposition process, corrosion protection phenomenal and the electrodeposition parameter.

Topics

[Corrosion](#), [Electrodeposition](#)

## REFERENCES

1.

Abou-Krishna

M.M

,  
Rageh

H.M  
&  
Matter

E.A

,  
2008

,  
Electrochemical Studies On The Electrodeposited Zn-Ni-Co Ternary Alloy In Different Media

,  
*Surface And Coatings Technology*

, Vol.  
202

,  
3739

—

3746

<https://doi.org/10.1016/j.surfcoat.2008.01.015>

[Google Scholar](#)

[Crossref](#)

2.

Afolabi

A.S

,  
2007

,

Synergistic Inhibition Of Pottassium Chromate And Sodium Nitrate On Mild Steel In Chloride And Sulphide Media

,  
*Leonardo Electronic Journal Of Practices And Technology*

, Issue

11

,  
143

—

154

[Google Scholar](#)

3.

Azevedo

M.S

,  
Allely

C

,  
Ogle

K

&

Volovitch

P

,  
2015

,  
Corrosion Mechanism Of Zn (Mg, Al) Coated Steel In Accelerated Tests And Natural Exposure: The Role Of Electrolyte Composition In The Nature Of Corrosion Products And Relative Corrosion Rate

,  
*Corrosion Science*

,  
90

,  
472

—

481

<https://doi.org/10.1016/j.corosci.2014.05.014>

[Google Scholar](#)

[Crossref](#)

4.  
De Rincon

O  
,  
Rincon

A  
,  
Sanchez

M  
,  
Romero

N  
,  
Salas

O  
,  
Delgado

R  
,  
Lopez

B  
,  
Uruchurtu

J  
,  
Marroco

M  
&  
Panosian

Z  
,  
2009

,  
Evaluating Zn, Al And Al-Zn Coatings Carbon Steel In A Special Atmosphere

,

*Corrosion And Building Materials*

,  
23

,  
1465

–

1471

<https://doi.org/10.1016/j.conbuildmat.2008.07.002>

[Google Scholar](#)

[Crossref](#)

5.

Doner

A

,  
Solmaz

R

,  
Ozcan

M

&

Kardas

G

,  
2011

,  
Experimental And Theoretical Studies Of Thiazoles As Corrosion Inhibitors For Mild Steel In Sulphuric Acid Solution

,  
*Corrosion Science*

,  
53

,  
2902

–

2913

<https://doi.org/10.1016/j.corsci.2011.05.027>

[Google Scholar](#)

[Crossref](#)

6.

Fatoba

O.S

,

Popoola

A.P.I

,

Fedatova

T

&

Pityana

S.I

,

2015

,

Electrochemical Studies On The Corrosion Behaviour Of Laser Alloyed Zn-Sn Coatings  
On Uns G10150 Steel In 1m Hcl Solution

,

*Silicon*

,

7

,

357

—

369

<https://doi.org/10.1007/s12633-015-9319-2>

[Google Scholar](#)

[Crossref](#)

7.

Gautam

V

,

Patnaik

A

&

Bhat

I.K

,  
2015

,  
Thermo-Mechanical And Fracture Characterization Of Uncoated, Single And Multilayer  
(Sin/Crn) Coating On Granite Powder Filled Metal Alloy Composite

,  
*Silicon*

,  
3

,  
9318

–

9328

[Google Scholar](#)

8.

Marder

A.R

,  
2000

,  
The Metallurgy Of Zinc-Coated Steel

,  
*Progress In Material Sciences*

, Vol.

45

,  
191

–

271

[https://doi.org/10.1016/S0079-6425\(98\)00006-1](https://doi.org/10.1016/S0079-6425(98)00006-1)

[Google Scholar](#)

[Crossref](#)

9.

Popoola

A.P.I

,  
Fayomi

O.S.I

&

Popoola

O.M

,  
2012

,  
Comparative Studies Of Microstructural, Tribological And Corrosion Properties Of  
Plated Zn And Zn-Alloy Coatings

,  
*International Journal Of Electrochemical Science*

,  
7

,  
4860

–

4870

[Google Scholar](#)

10.

Wang

X.Y

&

Li

D.Y.

,  
2003

,  
Mechanical, Electrochemical And Tribological Properties Of Nano-Crystalline Surface  
Of 304 Stainless Steel

,  
*Wear*

,  
255

,  
836

–

845

.  
[https://doi.org/10.1016/S0043-1648\(03\)00055-3](https://doi.org/10.1016/S0043-1648(03)00055-3)

[Google Scholar](#)

[Crossref](#)

11.

Miller

W.S

,  
Zhuang

L

,  
Bottema

J

,  
Wittebrood

A.J

,  
De Smet

P

,  
Haszler

A

&  
Vierregge

A

,  
2000

,  
Recent Development In Aluminium Alloys For The Automotive Industry

,  
*Materials Science And Engineering*

,  
280

,  
37

—

49

[https://doi.org/10.1016/S0921-5093\(99\)00653-X](https://doi.org/10.1016/S0921-5093(99)00653-X)

[Google Scholar](#)

[Crossref](#)

12.

Fayomi

,

O.S.I.

,  
Atayero

,  
A.A.

,  
Mubiayi

,  
M.P.

,  
Akande

,  
I.G.

,  
Adewuyi

,  
P.A.

,  
Fajobi

,  
M.A.

,  
Ayara

,  
W.A.  
and  
Popoola

,  
A.P.I.

,  
2019

.  
Mechanical and opto-electrical response of embedded smart composite coating  
produced via electrodeposition technique for embedded system in defence application

.  
*Journal of Alloys and Compounds*

,  
773

,  
305

—  
313

.  
<https://doi.org/10.1016/j.jallcom.2018.09.191>

[Google Scholar](#)

[Crossref](#)

13.

Abioye

,

O. P.

,

Loto

,

C. A.

,

&

Fayomi

,

O. S. I.

(

2019

).

Evaluation of anti-biofouling progresses in marine application

.

*Journal of Bio-and Tribo-Corrosion*

,

5

(

1

),

22

.

<https://doi.org/10.1007/s40735-018-0213-5>

[Google Scholar](#)

[Crossref](#)

14.

Fayomi

,

O. S. I.

,

Oluwadare

,

G. A.

,

Fakehinde

,

O. B.

,

Akande

,  
I. G.

,  
Nwachia

,  
W.

,  
Oziegbe

,  
U.

, &  
Russell

,  
A. J.

(  
2019

).

Evolution of physical and mechanical characteristics of deposited composite coatings  
on A356 mild steel

.

*The International Journal of Advanced Manufacturing Technology*

,  
103

(  
5-8

),  
2621

—  
2625

.

<https://doi.org/10.1007/s00170-019-03714-1>

[Google Scholar](#)

[Crossref](#)

15.

Fayomi

,  
O. S. I.

,  
Akande

,  
I. G.

,  
Abioye

,

O. P.  
, &  
Fakehinde

,  
O. B.  
(  
2019  
).

New trend in thin film composite coating deposition: A mini review

.  
*Procedia Manufacturing*

,  
35

,  
1007

—  
1012

.  
<https://doi.org/10.1016/j.promfg.2019.06.049>

[Google Scholar](#)

[Crossref](#)

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