

Surface Modification of Light Metals by Electrolysis

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Surface treatment of magnesium alloys for anticorrosion

Surface treated films need compatibility and adhesiveness with the substrate metals, and also response to the external environment.

Stability of film

hydroxyapatite

- $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$
- $\text{Al}(\text{OH})_3$
- $\text{Cr}(\text{OH})_3$
- $\text{Ca}_3(\text{PO}_4)_2$
- $\text{Sn}(\text{OH})_2$
- $\text{Zn}(\text{OH})_2$
- $\text{Mg}_3(\text{PO}_4)_2$
- $\text{Ce}(\text{OH})_3$
- CrPO_4
- MgF_2
- $\text{Mg}(\text{OH})_2$

Self-healing

- $\text{Ce}^{4+}/\text{Ce}^{2+}$
- $\text{Sn}^{4+}/\text{Sn}^{2+}$
- $\text{MnO}_4^-/\text{Mn}^{2+}$
- $\text{MoO}_4^-/\text{Mo}^{2+}$
- $\text{Cr}^{3+}/\text{Cr}^{2+}$

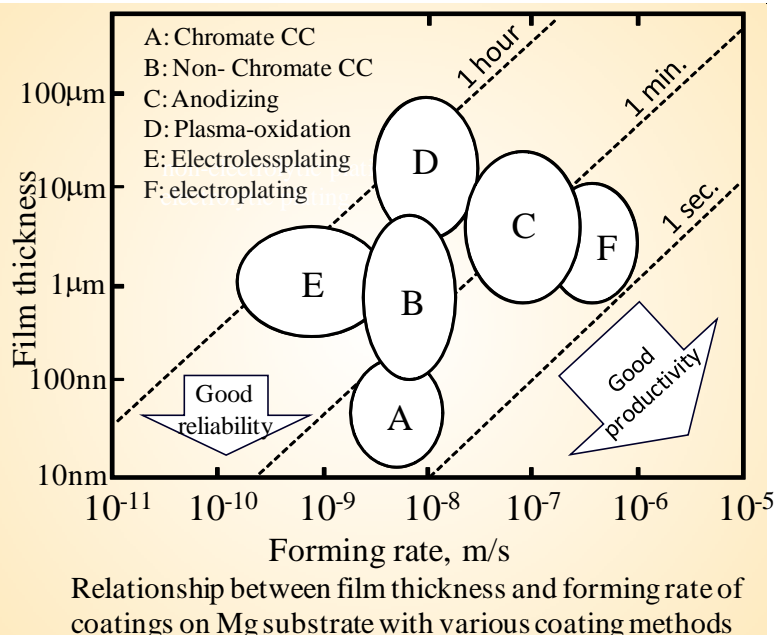
For anti-corrosion

Controlling anodic reactions

Passive film, Self-reorganization, Anodized film, Chemical conversion treatment, Painting

Controlling cathodic reactions

Surface treatment to increase hydrogen overpotential, Eliminating impurities inducing hydrogen generation, Increase of pH



Formation of hydrophobic surface

