

1. INDUSTRIAL COATINGS BY ELECTROPHORETIC DEPOSITION:

An advanced coating technology at room temperature based on Electrophoretic deposition has been developed with a technology readiness level of TRL-6. The process is simple, rapid, cost effective and easy to scale up. It can be used to coat any type of material- organic or inorganic, including ceramics, metals, clays, pigments, polymers, graphene, carbon nanotube and their composites on any type of surface - flat, tubular or complex shapes.

Electrophoretic Deposition

Principle: Charged particles in a liquid migrate towards oppositely charged electrode and get deposited there on application of electric field)

Materials that can be coated: Any material- ceramic, metal, clay, polymer, CNT, graphene, micro-as well as nanomaterials

Application: Corrosion resistance
Hydrophobic coating
Abrasive coating
Biomaterials coating
Functionally graded material coating
Graded porosity coating

Industry: Steel, Abrasive and polishing, marine environment, automobile, high temperature applications, biomedical, electronic industry, textile

Coating on Flat surface

Photographs of TiO₂ deposited on steel substrates (7 cm x 10 cm) [EPD conditions: 3.5 wt% suspension in ethanol, 100 V, 30 sec]

After bendtest of TiO₂ deposited on steel substrates (5 cm x 7 cm) The sample was bent to 90 degrees

Coating on Tubular surface

Coating on Complex shape

Before Coating

After Coating

Graphene coating on anode rod for aluminium refining industry

Uncoated

Coated with Graphene Oxide (GO)



CURRENT STATUS:

- The technology is fully mechanized and computer controlled.
- The technology is generic, and customized coating solution can be provided to specific needs of any industry. (TRL LEVEL-6)